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Undergraduate Announcement
1913-1914



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OFFICIAL REGISTER OF PRINCETON UNIVERSITY

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These publications include:

The Catalogue of the University.

The Undergraduate Announcement.

The Reports of the President and the Treasurer.

The Descriptive Booklet.

The June Freshman Entrance Examination Papers.

The Announcements of the several Departments, relating to the work of the next year. These are made as accurate as possible, but the right is reserved to make such changes in detail as circumstances may require.

The current number of any of these publications may be obtained by application to the Secretary of the University, Princeton, New Jersey.

PRINCETON UNIVERSITY

Undergraduate Announcement



ADMISSION; PLAN OF STUDY; COURSES; HONORS;
EXAMINATIONS, STANDING, AND GRADUA-
TION; GENERAL ORDERS, ALLOTMENT
AND RENTAL OF ROOMS, PRIZES,
REMISSION OF TUITION,
SCHOLARSHIPS

Published by Princeton University

1913



CALENDAR

1913

- Sept. 15-27.* Examinations for removal of first and second term conditions.
- Sept. 18-22.* Examinations for admission, held in Princeton only.
- Sept. 24.* First term begins.
- Sept. 25, 3 P M.* Formal opening exercises.
- Sept. 30.* Last day for enrolment of Graduate Students at the office of the Dean of the Graduate School and the office of the Registrar.
- Oct. 21.* Meeting of the Board of Trustees.
- Oct. 22.* Commemoration Day. Dedication of the Graduate College.
- Nov. 26, 1.30 P. M.—Dec. 1, 10.30. A. M.* Thanksgiving recess.
- Nov. 27.* Thanksgiving Day.
- Dec. 15-20.* Examinations for removal of entrance conditions.
- Dec. 20. 1.30 P. M.* Christmas vacation begins.

1914

- Jan. 5, 10.30 A. M.* Christmas vacation ends.
- Jan. 8.* Meeting of the Board of Trustees.
- Jan. 19.* Last day for reporting second term electives.
- Feb. 11.* First term examinations end.
- Feb. 12.* Second term begins.
- Feb. 22.* Washington's Birthday.

- Feb. 23.* Washington's Birthday exercises. Class of 1876 Prize Debate.
- March 15.* Last day for receiving applications for Fellowships and Graduate Scholarships.
- March 25, 12 M.* Meeting of Faculty Committee on Course of Study.
- March 30-April 4.* Examinations for removal of conditions in first term Senior subjects.
- April 8, 1.30 P. M.—April 14, 10.30 A. M.* Spring recess.
- April 9.* Meeting of the Board of Trustees.
- June 3.* End of Senior final examinations.
- June 12.* End of examinations of the three lower classes.
- June 13.* Junior Orator and Maclean Prize contests.
- June 14.* Baccalaureate Sunday.
- June 15.* Commencement meeting of the Board of Trustees. Annual meetings of the Literary Societies. Class Day.
- June 16.* 167th Annual Commencement. Alumni Trustee election. Alumni luncheon.
- June 17-20.* Examinations for admission, held simultaneously in Princeton and elsewhere.
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- Sept. 14-26.* Examinations for removal of first and second term conditions.
- Sept. 17-21.* Examinations for admission, held in Princeton only.
- Sept. 23.* First term begins.
- Sept. 24, 3 P. M.* Formal opening exercises.
- Sept. 30.* Last day for enrolment of Graduate Students at the office of the Dean of the Graduate School and the office of the Registrar.
- Oct. 22.* Commemoration Day. Meeting of the Board of Trustees.

- Nov. 25, 1.30 P. M.*—*Nov. 30, 10.30 A. M.* Thanksgiving recess.
- Nov. 26.* Thanksgiving Day.
- Dec. 14-19.* Examinations for removal of entrance conditions.
- Dec. 23, 1.30 P. M.* Christmas vacation begins.

1915

- Jan. 7, 10.30 A. M.* Christmas vacation ends.
- Jan. 14.* Meeting of the Board of Trustees.
- Jan. 18.* Last day for reporting second term electives.
- Feb. 10.* First term examinations end.
- Feb. 11.* Second term begins.
- Feb. 22.* Washington's Birthday. Class of 1876 Prize Debate.
- March 15.* Last day for receiving applications for Fellowships and Graduate Scholarships.
- March 22-27.* Examinations for removal of conditions in first term Senior subjects.
- March 31, 12 M.* Meeting of Faculty Committee on Course of Study.
- March 31, 1.30 P. M.*—*April 6, 10.30 A. M.* Spring recess.
- April 8.* Meeting of the Board of Trustees.
- June 2.* End of Senior final examinations.
- June 11.* End of examinations of the three lower classes.
- June 12.* Junior Orator and Maclean Prize contests.
- June 13.* Baccalaureate Sunday.
- June 14.* Commencement meeting of the Board of Trustees. Annual meetings of the Literary Societies. Class Day.
- June 15.* 168th Annual Commencement. Alumni Trustee Election. Alumni luncheon.
- June 16-19.* Examinations for admission, held simultaneously in Princeton and elsewhere.

TERMS OF ADMISSION TO PRINCETON UNIVERSITY

For admission to the freshman class a candidate must satisfy the requirements of one of the two methods described below:

I. REGULAR METHOD OF ADMISSION OPEN TO ALL CANDIDATES

(1) A candidate must pass satisfactorily written examinations in all of the subjects required for admission as enumerated on pp. 19 to 21 of this booklet. He may, however, be admitted conditionally if he is deficient in a small part only of the subjects required.

(2) Each applicant for admission should be provided with a statement, signed by his teacher, as to his fitness to be examined in each of the subjects which he offers. This statement is for the information of the examiners, and is in no sense an admission certificate. Blank forms may be obtained from the Registrar.

[*Preliminary Examination*]

(3) At the examinations in June and September, candidates for admission to the freshman class at some later time are admitted to examination in a portion of the subjects required for entrance. Each candidate for preliminary examination must present a certificate, signed by his teacher, stating that he is prepared in each of the subjects which he may offer. *No credit will be given for a preliminary examination in any subject in which the candidate is not so certified.*

II. AN ALTERNATIVE METHOD OF ADMISSION OPEN TO CANDIDATES OF EXCEPTIONAL ABILITY AND ATTAINMENT

In addition to the regular method of entrance to the freshman class *in courses leading to the bachelor's degrees*, the following method is open to candidates of exceptional ability and attainment.

A candidate for admission under this method may send to the Registrar, not later than two weeks before the beginning of either the June or the September examinations, a detailed statement, signed by the principal of his school, which shall show the course of study which he has pursued during the past four years and the degree of proficiency which he has attained in each subject. This statement may be submitted on a blank sent upon request by the Registrar, or in some form convenient to the school.

If the Committee on Entrance is satisfied from this statement that the candidate has completed the subjects required for admission to Princeton and has attained a degree of proficiency distinctly above the average, the committee may give him permission to apply for entrance under this plan. This permission will not be granted to candidates who have previously failed in any Princeton examinations for entrance under the regular plan.

A candidate so accepted, must present himself for examination in four subjects designated by the committee. This examination will be based on the candidate's work in the four principal subjects: for A.B. candidates—Mathematics, Latin, English and Greek; for Litt.B. or B.S. candidates—Mathematics, Latin, English and a Modern Language. It will be noted that these are the *required* subjects of the regular plan and form the basis of the work of the freshman year. These examinations will be comprehensive in character but particular emphasis will be laid upon the later or more advanced portions of the work. A candidate who

passes creditably in all these subjects will be admitted to the freshman class without conditions.

Statement of School Record

The statement of the candidate's school record should contain the following information:

(a) The textbooks used in each year of his work in each subject.

(b) The number of weeks devoted each year to each subject.

(c) The number of hours per week devoted each year to each subject.

(d) The grade attained each year in each subject, together with an explanation of the system of marking.

The Examinations

The order of the examinations will be as follows: Mathematics, Latin, English, Greek or a Modern Language. A printed schedule of these examinations may be had upon application to the Registrar. All examinations will be three hours in length.

Mathematics

The examination in Mathematics will cover the subjects required for admission, including Algebra I and II, Plane and Solid Geometry and Plane Trigonometry. Candidates who offer Mathematics through Plane Geometry only, and candidates who offer Solid Geometry and Plane Trigonometry in addition, will find printed upon the examination paper the instructions necessary for their guidance.

Latin

The examination in Latin will test the candidate's ability to read both prose and poetry. The examination will consist of sight passages, usually from Cicero and Virgil, with

questions upon the principles of syntax, prosody, etc., illustrated in the text, and the translation of sentences from English into Latin.

English

The examination in English will cover the usual ground of the examinations in English A and English B under the regular plan, laying particular emphasis upon the candidate's ability to write English correctly.

Greek

The examination in Greek will test the candidate's ability to translate prose and poetry. The examination will consist of sight translation of prose and selections from the poetry required for entrance, with grammatical questions upon the principles of syntax, prosody, etc., illustrated in the text, and the translation of sentences from English into Greek.

Modern Language

Candidates who offer German or French for admission will take the German A (Elementary German) or German B (Intermediate German), or French A (Elementary French) or French B (Intermediate French) examinations which are set under the regular plan. The examination which the candidate must take will be determined by the committee on the basis of the candidate's preparation, and the candidate will be notified.

ENTRANCE FEE

Each candidate who proposes to take the Princeton entrance examinations in June should send to the Registrar, before June 1st if possible:

(a) A statement containing his full name and the name and address of his parent, or guardian, and of his school. If he has taken preliminary examinations, this should be stated.

(b) A fee of five dollars, either by money order or cheque payable to *Princeton University*.

In return he will receive a receipt from the Registrar which he must show to the examiner when he registers at the examination.

Candidates who have not sent this statement and fee may be admitted to the examinations; in such cases the reports of the results of the examinations may be delayed, and in no case will a report be sent until the fee is received.

Each candidate who takes his examinations in September must pay the fee, unless he has already paid it in June, but those who have paid the fee in June shall be admitted without further payment to the September examinations of the same year. Candidates taking examinations in different years shall pay the fee each year.

Each candidate admitted to any class otherwise than by the regular examinations of the University, e.g., on certificate of the College Entrance Examination Board, shall pay an admission fee of five dollars.

ENTRANCE EXAMINATIONS

In June 1914 the order of examinations will be as follows:

Wednesday—17 June, 1914

8.30- 9.00	Registration of all candidates
9.00-11.00	Algebra I and II
11.00-12.00	Ancient History
12.00- 1.00	American History
*2.30- 4.30	Chemistry
*2.30- 4.30	Greek A and B
4.30- 5.30	English History

Thursday—18 June, 1914

9.00-11.00	Latin A (Grammar, Composition, Caesar)
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*Any candidate who wishes to offer Chemistry and Greek A or B, or Physics and Greek C at the same examination must notify the Registrar in advance.

11.00-12.00 Latin B (Cicero)

12.00- 1.00 Latin C (Virgil)

2.30- 4.00 English A

4.00- 5.30 English B

Friday—19 June, 1914

8.30-11.00 Plane and Solid Geometry

*11.00-12.00 Greek C (Homer)

*11.00- 1.00 Physics

2.30- 4.00 Elementary German (German A)

2.30- 5.30 Intermediate German (German B)

Saturday—20 June, 1914

9.00-11.00 Elementary French (French A)

9.00-12.00 Intermediate French (French B)

1.30- 3.30 Plane Trigonometry

In September 1914 the order of examinations will be as follows:

Thursday—17 September, 1914

8.30- 9.00 Registration of all candidates

9.00-11.00 Algebra I and II

11.00-12.00 Ancient History

12.00- 1.00 American History

*2.30- 4.30 Chemistry

*2.30- 4.30 Greek A and B

4.30- 5.30 English History

Friday—18 September, 1914

9.00-11.00 Latin A (Grammar, Composition, Caesar)

11.00-12.00 Latin B (Cicero)

12.00- 1.00 Latin C (Virgil)

2.30- 4.00 English A

4.00- 5.30 English B

* See footnote on page 11.

Saturday—19 September, 1914

- 8.30-11.00 Plane and Solid Geometry
 *11.00-12.00 Greek C (Homer)
 *11.00- 1.00 Physics
 2.30- 4.00 Elementary German (German A)
 2.30- 5.30 Intermediate German (German B)

Monday—21 September, 1914

- 9.00-11.00 Elementary French (French A)
 9.00-12.00 Intermediate French (French B)
 1.30- 3.30 Plane Trigonometry

All candidates are expected to appear promptly at the time set for an examination. No candidate will be allowed to enter an examination later than a quarter of an hour after the scheduled time; and no candidate who has seen a question paper will be allowed to leave the examination until half an hour shall have elapsed.

Applicants who have any conditions or other deficiencies from the June examinations are required to remove them at the September entrance examinations.

Two regular examinations for admission are held each year, one in June and one in September. In June, examinations are held in the places named in the following list, and at other schools and cities where the number of candidates, or the distance from places where regular examinations are held, may justify. Requests for examinations at places other than those here named should be addressed to the Registrar before April 1. In September, examinations are held in Princeton only.

ALABAMA

Marion: at the Marion Institute

Mobile: at the University Military School, 933
 Dauphin Way

* See footnote on page 11.

CALIFORNIA

Los Angeles: in the Y. M. C. A. Building, South
Hope St.

COLORADO

Denver: at the East Side High School

CONNECTICUT

Cheshire: at the Cheshire School
Pomfret Center: at the Pomfret School
Ridgefield: at the Ridgefield School
Wallingford: at the Choate School
Washington: at the Gunnery School

DELAWARE

Wilmington: at the Friend's School

DISTRICT OF COLUMBIA

Washington: in the Y. M. C. A. Building,
1736 G St., N. W.

FLORIDA

Jacksonville: in the Law Offices of Cooper & Cooper
Pensacola: at the Pensacola Classical School

ILLINOIS

Chicago: in Hurd Hall, Northwestern University Law
School Building, 87 East Lake St.

INDIANA

Culver: at the Culver Military Academy
Howe: at the Howe School
Indianapolis: at the Shortridge High School

KENTUCKY

Louisville: in the office of the Fidelity Trust Co., 206-
210 Fifth St.

MARYLAND

Baltimore: in the Y. M. C. A. Building, Cathedral and Franklin Sts.

Port Deposit: at the Tome School

MASSACHUSETTS

Andover: at the Phillips Academy

Boston: in the Young Men's Christian Union Building,
48 Boylston St.

Mount Hermon: at the Mount Hermon Boys' School

MICHIGAN

Detroit: at the Central High School

MINNESOTA

St. Paul: in charge of Mr. J. D. Denegre, Gilfillan Block

MISSOURI

Kansas City: at the Central High School

St. Louis: in the Board of Education Building, Ninth and Locust Sts.

NEBRASKA

Omaha: in charge of Mr. Glenn C. Wharton, 604 S. 37th St.

NEW HAMPSHIRE

Plymouth: at the Holderness School

NEW JERSEY

Bordentown: at the Bordentown Military Institute

Hightstown: at Peddie Institute

Lawrenceville: at the Lawrenceville School

Morristown: at the Morris Academy

Newark: at the Newark Academy, High and William Streets

Princeton: Room 10, McCosh Hall

Trenton: in the Y. M. C. A. Building

NEW YORK

- Albany: at the Albany Academy
Allaben: at the Mountain School
Buffalo: at the Lafayette High School
Dobbs Ferry: at the Mackenzie School
Garden City: at the St. Paul's School
Hoosick: at the Hoosac School
Lake Placid: at the Lake Placid School
Mohegan: at the Mohegan Lake School
New York: in the Y. M. C. A. Building, Twenty-third
St., near Seventh Ave.
Ossining: at the Holbrook School
Pawling: at the Pawling School
Poughkeepsie: at the Riverview Academy
Rochester: in the Municipal Building, South Fitzhugh
Street
Syracuse: in the rooms of the University Club, Larned
Building

NORTH CAROLINA

- Asheville: at the Asheville School

OHIO

- Cincinnati: at the Hughes High School
Cleveland: at the University School, Hough Ave. and
Seventy-first St.
Youngstown: at the Rayen School

OREGON

- Portland: at the Portland Academy

PENNSYLVANIA

- Bellefonte: at the Bellefonte Academy
Harrisburg: at the Harrisburg Academy
Mercersburg: at the Mercersburg Academy
Pennsburg: at the Perkiomen Seminary

Philadelphia: at the Central High School
Pittsburgh: at Shady-Side Academy
Pottstown: at the Hill School
Saltsburg: at the Kiskiminetas Springs School
Titusville: at the High School
Wayne: at St. Luke's School
Wilkes-Barre: in the rooms of the Luzerne County
Medical Society, Anthracite Building, West Mar-
ket Street

TENNESSEE

Chattanooga: at Baylor's University School
Memphis: at the University School
Nashville: in the Carnegie Library

TEXAS

San Antonio: at the San Antonio Academy

WASHINGTON

Seattle: at the Broadway High School
Spokane: at the Lewis and Clark High School
Tacoma: at the High School

FRANCE

Paris: at the Anglo-Saxon School, 55 Boulevard Suchet

GERMANY

Munich: at the Coit School for Boys, Konradstrasse 14.

Examinations at other than the specified times are granted only under very exceptional circumstances. An applicant for examination at a special time must present a satisfactory reason and obtain permission by writing to the Registrar and is required to pay into the treasury a fee of \$10 for every subject, or part thereof, in which an examination is set. No special examinations are held outside of Princeton.

All candidates for admission to any class, or as special students, must bring with them satisfactory testimonials of good moral character, preferably from their last instructors, and if the candidate has been a member of another college, university, or similar institution, he must produce a certificate from its president or faculty that he is free from censure in that institution.

No candidate is admitted into the undergraduate department in regular class standing without examination and a vote of the Faculty.

FRESHMAN ENTRANCE REQUIREMENTS

The following entrance requirements are defined for the most part in close accordance with the recommendations of the National Educational Association and of the College Entrance Examination Board. It is recommended that candidates be prepared for examination on the requirements as specified, but equivalents will be accepted. The University will in all cases be the judge of the equivalence of subjects offered as substitutes for the specified requirements.

There are three regular forms of entrance to the courses leading to degrees in Princeton University, viz.: (1) Entrance for those who offer Greek and are candidates for the degree of A.B. (2) Entrance for those who do not offer Greek and are candidates for the degree of B.S. or Litt.B., for which the entrance requirements are identical. (3) Entrance for those who are candidates for the degree of C.E.

The degree of Bachelor of Science is open to those who concentrate in one of the mathematical or scientific departments during the junior and senior years; the degree of Bachelor of Letters to those who concentrate in one of the departments in philosophical, political, literary, or rather humanistic studies.

The freshman entrance requirements for candidates for the various degrees given in course in Princeton University are as follows: (the detailed statements of subjects are given on pages 21 to 34).

FRESHMAN ENTRANCE REQUIREMENTS FOR THE COURSES
LEADING TO THE DEGREES OF A.B., B.S., AND LITT.B.

Every candidate must offer all the subjects in one of the following lists:

A.B. COURSE	B.S.-LITT.B. COURSE
GREEK	MODERN LANGUAGES: Either
1. Greek A	1. French A, or
2. Greek B	1. German A
3. Greek C	
LATIN	LATIN
1. Latin A	1. Latin A
2. Latin B	2. Latin B
3. Latin C	3. Latin C
ENGLISH	ENGLISH
1. English A (reading)	1. English A (reading)
2. English B (careful study)	2. English B (careful study)
MATHEMATICS	MATHEMATICS.
1. Algebra to Quadratics	1. Algebra to Quadratics
2. Algebra, Quadratics through the Binomial Theorem	2. Algebra, Quadratics through the Binomial Theorem
4. Plane Geometry	4. Plane Geometry

In addition to the prescribed subjects named above, every candidate must offer such a selection of subjects from the following list that the sum of values assigned (in parentheses) to the several subjects shall amount to not less than five for the A.B. candidate and to not less than seven for the B.S.-Litt.B. candidate. But no candidate may offer more than two of the three subjects in History.

HISTORY: Not more than *two* of:

1. American History and Civil Government (1)
2. English History (1)
3. Ancient History (1)

MODERN LANGUAGES

1. French A (4), if not offered in the list of prescribed subjects
2. French B (2)
1. German A (4), if not offered in the list of prescribed subjects
2. German B (2)

MATHEMATICS

5. Solid Geometry (1)
6. Plane Trigonometry (1)

SCIENCE

1. Physics (2)
1. Chemistry (2)

FRESHMAN ENTRANCE REQUIREMENTS FOR THE COURSE
LEADING TO THE DEGREE OF C.E.

[*N. B.—No student will be admitted to regular standing in the C.E. freshman class who has failed to pass all the mathematical subjects required for entrance; and no student who has any deficiency in mathematics will be admitted even on trial unless this deficiency is slight and the quality of his work in other subjects required for entrance is high.*]

Every candidate for admission to the C.E. course must offer the following subjects:

ENGLISH

1. English A (reading)
2. English B (careful study)

FOREIGN LANGUAGES: Any two of the three languages

Latin: 1. Latin A

French: 1. French A

German: 1. German A

MATHEMATICS

1. Algebra to Quadratics
2. Algebra, Quadratics through the Binomial Theorem
4. Plane Geometry
5. Solid Geometry
6. Plane Trigonometry

SCIENCE: Either

1. Physics, or
1. Chemistry

In addition to the prescribed subjects named above every candidate for the C.E. course must offer such a selection of subjects from the following list that the sum of the values assigned (in parentheses) to the several subjects shall amount to not less than five. But no candidate may offer more than two of the three subjects in History.

HISTORY: Not more than *two* of

1. American History and Civil Government (1)
2. English History (1)
3. Ancient History (1)

FOREIGN LANGUAGES

1. Latin A (4), if not offered in the list of prescribed subjects
2. Latin B (2)
3. Latin C (2)
1. French A (4), if not offered in the list of prescribed subjects
2. French B (2)
1. German A (4), if not offered in the list of prescribed subjects
2. German B (2)

SCIENCE

1. Physics (2), if not offered in the list of prescribed subjects
1. Chemistry (2), if not offered in the list of prescribed subjects

[It is recommended that all candidates should receive instruction in free-hand drawing before entrance.]

FRESHMAN ENTRANCE SUBJECTS

HISTORY

It is recommended that each of the following courses be pursued in the spirit and by the methods suggested in the Report of the Committee of Seven of the American Historical Association on the Study of History in Schools. (The Macmillan Co., 1899.)

(1) *American History and Civil Government.* The course of study recommended for American History and Civil Government should occupy four exercises a week for one year. Military details may be omitted. The origins

of the American people and the development of their political life should be clearly understood in their main outlines.

(2) *English History*. For the period preceding the Norman invasion a brief outline will suffice. The course of English History after that event down to 1850 should be carefully studied with proper reference to the development of political institutions.

(3) *Ancient History*. For the present the requirement will be restricted to Greek History to the death of Alexander the Great and Roman History to the accession of Commodus. As soon as it appears practicable, notice will be given and the requirement will be extended to comprise "Ancient History, with special reference to Greek and Roman History, and including also a short introductory study of the more ancient nations and the chief events of the Middle Ages down to the death of Charles the Great (814)." It is recommended that instruction in the schools should be extended to comprise Ancient History in the sense above defined.

GREEK

(1) *Greek A*. Grammar: the inflections; the simpler rules for composition and derivation of words; syntax of cases and moods; structure of the sentence in general, with particular regard to relative and conditional sentences.

(2) *Greek B*. Greek composition and Xenophon's *Anabasis*. This examination will assume the reading of four books of Xenophon's *Anabasis*. The paper will also include sight translation of prose of no greater difficulty than Xenophon's *Anabasis*. The sentences set for translation into Greek will be designed to test primarily the candidate's knowledge of forms and of the principles of syntax, and will be based on the first two books of the *Anabasis*.

(3) *Greek C*. Homer. The examination will assume the reading of the first three books of the *Iliad* (with the omission of Book II, 494-end.)

LATIN

The following requirements in Latin are in accordance with the recommendations made by the Commission on College Entrance Requirements in Latin, October 1909.

(a) *Amount and Range of the Reading Required*

(1) The Latin reading, without regard to the prescription of particular authors and works, shall not be less *in amount* than Caesar, *Gallic War*, I-IV; Cicero, the orations against Catiline, for the Manilian Law, and for Archias; Virgil, *Æneid*, I-VI.

(2) The amount of reading specified above shall be selected by the schools from the following authors and works; Caesar, *Gallic War* and *Civil War*, and Nepos, *Lives*; Cicero, *Orations*, *Letters*, and *De Senectute*, and Sallust, *Catiline* and *Jugurtha*; Virgil, *Bucolics*, *Georgics*, and *Æneid*, and Ovid, *Metamorphoses*, *Fasti*, and *Tristia*.

(b) *Scope of the Examinations*

(1) *Translation at Sight.* Candidates will be examined in translation at sight of both prose and verse. The vocabulary, constructions, and range of ideas of the passages set will be suited to the preparation secured by the reading indicated above.

(2) *Prescribed Reading.* Candidates will be examined also upon the following prescribed reading: Cicero, orations for the Manilian Law and for Archias, and Virgil, *Æneid*, I, II and either IV or VI, at the option of the candidate, with questions on subject-matter, literary and historical allusions, and prosody. Every paper in which passages from the prescribed reading are set for translation will contain also one or more passages for translation at sight; and candidates must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part.

(3) *Grammar and Composition.* The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose.

Suggestions Concerning Preparation

Exercises in translation at sight should begin in school with the first lessons in which Latin sentences of any length occur, and should continue throughout the course with sufficient frequency to insure correct methods of work on the part of the student. From the outset particular attention should be given to developing the ability to take in the meaning of each word—and so gradually, of the whole sentence—just as it stands; the sentence should be read and understood in the order of the original, with full appreciation of the force of each word as it comes, so far as this can be known or inferred from that which has preceded, and from the form and the position of the word itself. The habit of reading in this way should be encouraged and cultivated as the best preparation for all the translating that the student has to do. No translation, however, should be a mechanical metaphrase. Nor should it be a mere loose paraphrase. The full meaning of the passage to be translated, gathered in the way described above, should finally be expressed in clear and natural English.

A written examination cannot test the ear or tongue, but proper instruction in any language will necessarily include the training of both. The school work in Latin, therefore, should include much reading aloud, writing from dictation, and translation from the teacher's reading. Learning suitable passages by heart is also very useful, and should be more practised.

The work in composition should give the student a better understanding of the Latin he is reading at the time, if it is prose, and greater facility in reading. It is desirable, however, that there should be systematic and regular work in composition during the time in which poetry is read as well; for this work the prose authors already studied should be used as models.

Subjects for Examination

Latin A. This examination will be based upon the first two years' study of Latin, and will assume reading not less in amount than Caesar's *Gallic War*, Books I-IV, this reading to be selected from Caesar's *Gallic War* and *Civil War*, and Nepos' *Lives*, and will include sight translation, examination upon grammar (the inflections, the simpler rules for composition and derivation of words, syntax of cases and verbs, structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse and the subjunctive), and some easy sentences for translation from English into Latin, illustrating grammatical principles.

Latin B. This examination will assume reading not less in amount than Cicero's orations against Catiline, for the Manilian Law and for Archias. (The last two orations are prescribed.) The reading shall be selected from Cicero's *Orations*, *Letters*, *De Senectute*, Sallust's *Catiline*, and *Jugurtha*. It will include sight translation, grammatical questions, and compositions based upon Cicero.

Latin C. This examination will assume reading not less in amount than Virgil's *Æneid*, I to VI* (Books I, II and either IV or VI of the *Æneid* are prescribed). The remainder of the reading shall be selected from Virgil's *Bucolics*, *Georgics*, *Æneid*, and Ovid's *Metamorphoses*, *Fasti*, *Tristia*.

ENGLISH

(Both 1 and 2 to be offered by all candidates.)

The purpose of the examination is to test the candidate's knowledge and appreciation of certain masterpieces of English literature and his proficiency in English composition. The books prescribed for reading and for study are those recommended by the National Conference on Uniform Entrance Requirements in English.

(1) *English A.* (Reading.) The candidate may offer for examination any list of ten units which conforms to the requirements recommended by the National Conference on Uniform Entrance Requirements as printed below.

For 1914 and 1915:

The books provided for reading are arranged in the following groups, from which at least ten units* are to be selected, two from each group:

(a) The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey*, with the omission, if desired, of Books, I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Æneid*. The *Odyssey*, *Iliad*, and *Æneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

(b) Shakespeare's *The Merchant of Venice*; *Midsummer Night's Dream*; *As You Like It*; *Twelfth Night*; *Henry the Fifth*; *Julius Caesar*.

(c) Defoe's *Robinson Crusoe*, Part 1; Goldsmith's *The Vicar of Wakefield*; either Scott's *Ivanhoe*, or Scott's *Queen*

* Each unit is set off by semicolons.

tin Durward; Hawthorne's *The House of the Seven Gables*; either Dickens' *David Copperfield*, or Dickens' *A Tale of Two Cities*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; George Eliot's *Silas Marner*; Stevenson's *Treasure Island*.

(d) Bunyan's *Pilgrim's Progress*, Part I.; *The Sir Roger de Coverley Papers* in the *Spectator*; Franklin's *Autobiography* (condensed); Irving's *Sketch Book*; Macaulay's *Essays on Lord Clive* and *Warren Hastings*; Thackeray's *English Humorists*; Selections from Lincoln, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and Letter to Horace Greeley, along with a brief memoir or estimate; Parkman's *Oregon Trail*; either Thoreau's *Walden*, or Huxley's *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk*; Stevenson's *Inland Voyage* and *Travels with a Donkey*.

(e) Palgrave's *Golden Treasury* (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *The Deserted Village*; Coleridge's *The Ancient Mariner* and Lowell's *The Vision of Sir Launfal*; Scott's *The Lady of the Lake*; Byron's *Childe Harold*, Canto IV, and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series) Book IV, with especial attention to Wordsworth, Keats, and Shelley; Poe's *The Raven*, Longfellow's *The Courtship of Miles Standish*, and Whittier's *Snow Bound*; Macaulay's *Lays of Ancient Rome* and Arnold's *Sohrab and Rustum*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home*

Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City.

The following books, chosen from this list, are specially recommended; the examination will, however, be based on the complete list.

The *Old Testament*; the *Odyssey* in English translation; Shakespeare's *As You Like It* and *Julius Caesar*; Defoe's *Robinson Crusoe*, Part I; Scott's *Quentin Durward*; Selections from Lincoln; Macaulay's *Lord Clive* and *Warren Hastings*; Gray's *Elegy Written in a Country Churchyard* and Goldsmith's *Deserted Village*; Byron's *Prisoner of Chillon* and Arnold's *Sohrab and Rustum*.

The examination will consist of (a) questions and topics on the books offered, and (b) the writing of a short composition on some subject drawn from the candidate's general knowledge and experience. No candidate will be accepted in English A whose work is seriously defective in spelling, punctuation, idiom, or division into paragraphs.

(2) *English B.* (Careful study.) For 1914 and 1915: Shakespeare's *Macbeth*; Milton's *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

The examination will consist of (a) questions upon the content, form, and structure of the prescribed books, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of them, and (b) the writing of a composition on some subject drawn from the books prescribed for study, from the candidate's other studies, or from his general knowledge and experience. Questions may also be asked concerning the lives of the authors, their works, and the periods of literary history to

which they belong. However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling, or other essentials of good usage.

GERMAN

(1) *German A.* Candidates should be able to translate at sight a passage of simple German; to put into German short English sentences taken from the language of everyday life or a passage of simple connected prose; and to answer questions upon the rudiments of grammar.

Satisfactory preparation for this examination is furnished in the two-year course in elementary German recommended by the Modern Language Association. The course comprises drill in pronunciation, memorizing easy sentences, the rudiments of grammar with easy exercises illustrating grammatical forms and principals, and the reading of 75 to 100 pages of graduated texts from a reader, followed by 150 to 200 pages of easy stories and plays. It is recommended, however, that not more than one play be read.

(2) *German B.* Candidates should be able to translate at sight German prose of ordinary difficulty, whether recent or classical; to put into German a connected passage of ordinary English; and to answer any grammatical questions relating to usual forms and essential principles of the language, including syntax and word-formation.

Satisfactory preparation for this examination is furnished by the intermediate German course of three years recommended by the Modern Language Association. In addition to the preparation suggested for German A this preparation comprises the reading of about 400 pages of moderately difficult prose and poetry, with continued practice in grammar and composition.

FRENCH

(1) *French A.* Candidates should be able to translate at sight easy French prose, to put into French simple English sentences, or a passage of easy connected prose, and to answer questions on the rudiments of the grammar.

Satisfactory preparation for this examination is furnished in the two-year course in elementary French recommended by the Modern Language Association. The course comprises drill in pronunciation, the rudiments of grammar, memorizing easy sentences, with easy exercises illustrating grammatical forms and principles, translation into French, writing French from dictation, and the reading of 100 to 175 pages of graduated texts, followed by 250 to 400 pages of easy modern prose in the form of stories, plays, or historical biographical sketches.

(2) *French B.* Candidates should be able to translate at sight ordinary French prose or simple poetry, to put into French a connected passage of English prose and to answer questions involving a more thorough knowledge of syntax than is expected in French A.

Satisfactory preparation for this examination is furnished by the intermediate French course of three years recommended by the Modern Language Association. In addition to the course recommended for French A this preparation comprises the reading of from 400 to 600 pages of moderately difficult French, a portion of it to be in the dramatic form, exercise in giving French paraphrases, and continued practice in grammar and composition.

MATHEMATICS

In all numerical work special emphasis is laid upon accuracy and facility in reckoning.

In each of the following subjects simple original exercises will be set.

Problems having to do with lengths, areas, or volumes will usually be stated in terms of the metric system of weights and measures.

(1) *Algebra to Quadratics, A I.* The four fundamental operations for rational algebraic expressions, factoring, highest common factor, lowest common multiple, complex fractions, the solution of equations of the first degree containing one or more unknown quantities, radicals including the extraction of the square root of polynomials and numbers, and fractional and negative exponents.

(2) *Elementary Algebra, Quadratics through the Binomial Theorem, A II.* Quadratic equations, equations in one or more unknown quantities than can be solved by the methods of quadratic equations, ratio and proportion, the progressions, and the binomial theorem for positive integral exponents.

(4) *Plane Geometry.* Demonstrations of theorems, and constructions and demonstrations of problems; the solution of simple numerical exercises, including lengths of lines and areas of the triangle, parallelogram, trapezoid, regular polygons, and circle; simple original exercises in constructions and demonstration.

(5) *Solid Geometry.* Properties of straight lines and planes, of dihedral and polyhedral angles, of projections, of polyhedrons (including prisms, parallelopipeds, pyramids and the regular solids), of cylinders, cones, and spheres, of spherical triangles, and the mensuration of these solids and their surfaces.

(6) *Plane Trigonometry.* Definitions of the six trigonometric functions as ratios, relations between these six functions, values of the functions for 0° , 30° , 45° , 60° , 90° , 120° , 135° , etc., etc., formulas for the sine, cosine, and tangent of the sum or difference of two angles for all angles, formulas for the sum or difference of two sines or

two cosines, expressions for the functions of double and half angles, trigonometric identities and equations, theory of logarithms and the use of trigonometric tables, and the solution of right and oblique plane triangles. A knowledge of the meaning of the circular measure of angles and of the inverse trigonometric functions is also desirable. The tables furnished for this examination are Huntington's four-place tables, abridged edition, published by the Harvard Cooperative Society, Cambridge, Mass.

PHYSICS

The entrance requirements in Physics may be met in either of the two following ways:

(1) *Physics A and B.* By passing an examination on the subject as presented in such textbooks as those of Millikan and Gale, Carhart and Chute, Hoadley, or Gage's *Principles of Physics*. This examination is divided into two parts. *Physics A* consists of questions on the general laws of the subject, and the principles underlying certain physical phenomena; apart from the statement of the numerical relations involved in physical laws, this part of the examination is entirely descriptive. *Physics B* is devoted almost exclusively to numerical problems in the general subject.

(2) *Physics B and the presentation of a satisfactory laboratory notebook.* The examination in Physics B is described in the preceding paragraph. The notebook should contain accurate records of experimental work performed by the student during his course of preparation; it must bear the certificate of the instructor that the records were made by the student himself, and that they are a faithful description of laboratory work actually done by him; and it should be paged and indexed. The minimum number of experiments which will be accepted is 33, and it is suggested that the most satisfactory apportionment of these 33 among the different divisions of the subject is as follows: Mechanics

10, Heat 5, Light 5, Sound 2, Magnetism 3, and Electricity 8. In the case of the minimum number of experiments being submitted, this apportionment should be adhered to as closely as possible.

[In order to meet requirement 1 at least one school year, with four or five recitations per week, should be devoted to the subject. This course should be accompanied by class-room demonstrations conducted by the teacher. Requirement 2 may be met in the same length of time by dividing the time about equally between recitations based on a suitable textbook and laboratory exercises performed by the student himself. While it is desirable that this laboratory work have a large range and accordingly be mainly of a qualitative character, still due stress should be laid upon the performance of exact quantitative work.]

CHEMISTRY

(1) *Chemistry*. The candidate's preparation should include: (a) the study of a standard textbook, (b) instruction by lecture-table demonstrations, and (c) individual laboratory work, embracing at least forty exercises selected from some such list as that given by the College Entrance Examination Board for 1913.

The requirement embraces the sources and occurrence, preparation, physical and chemical properties of the following elements and their most important compounds: *oxygen*, *hydrogen*, *chlorine*, bromine, iodine, fluorine, *nitrogen*, *carbon*, *sulphur*, phosphorus, arsenic, *silicon*, *sodium*, potassium, *calcium*, magnesium, aluminium, *zinc*, *iron*, manganese, *copper*, mercury, silver, *gold*, lead, and tin. Detailed study should be given to the italicized elements and their compounds. Further, candidates should be well posted in matters relating to natural waters, the atmosphere, the laws of chemical combinations by weight and by volume, oxidation and reduction, combustion, nascent state, catalysis, bases, acids, and salts, the nature and structure of flames, precipi-

tation, distillation, crystallization, the elementary gas laws and their applications, the atomic and molecular theories, equation writing, stoichiometrical calculations and valency. They should also have some elementary knowledge of chemical energy, mass action, equilibrium, and the ionic theory.

At the examination each candidate must hand in, along with his paper, a notebook containing a detailed record of the practical work done by him in the laboratory, and *this notebook must bear the endorsement of his instructor.*

EXAMINATIONS OF THE COLLEGE ENTRANCE EXAMINATION BOARD

Examination certificates issued by the College Examination Board will be accepted in place of the regular entrance examinations, in so far as the certificates presented correspond to the requirements of the University, in accordance with the Table of Equivalents given below. Candidates offering such certificates are required to submit therewith the testimonials as to character and general fitness prescribed above for the other candidates. The latter testimonial shall state definitely the amount of work done in each subject offered for examination.

The examinations of the Entrance Board will be held during the week June 15-20, 1914.

All applications for examination must be addressed to the Secretary of the College Entrance Examination Board, Post Office Sub-Station 84, New York, N. Y., and must be made upon a blank form to be obtained from the Secretary of the Board upon application.

Applications for examination at points in the United States east of the Mississippi River, also at Minneapolis, St. Louis and other points on the Mississippi River, must be received by the Secretary of the Board at least two weeks in advance of the examinations, that is, on or before Mon-

day, June 1, 1914; applications for examination elsewhere in the United States or in Canada must be received at least three weeks in advance of the examinations, that is, on or before Monday, May 25, 1914, and applications for examination outside of the United States and Canada must be received at least five weeks in advance of the examinations, that is, on or before Monday, May 11, 1914.

Applications received later than the dates named will be accepted when it is possible to arrange for the admission of the candidate concerned, but only upon the payment of \$5.00 in addition to the usual fee.

The examination fee is \$5.00 for all candidates examined at points in the United States and Canada and \$15.00 for all candidates examined outside of the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June 1914, will be published about March 1. Requests that the examinations be held at particular points, to receive proper consideration, should be transmitted to the Secretary of the Board not later than February 1.

TABLE OF EQUIVALENTS

College Entrance Board

Princeton

ENGLISH

- | | |
|-------------------------------|--------------|
| (a) Reading and Practice..... | 1. English A |
| (b) Study and Practice..... | 2. English B |

HISTORY

- | | |
|---------------------------|---------------------|
| (a) Ancient History..... | 3. Ancient History |
| (c) English History..... | 2. English History |
| (d) American History..... | 1. American History |

LATIN

- | | | |
|---------------------------------------|---|------------------|
| (1) Grammar | } | 1. Latin A |
| (2) Elementary Prose
Composition | | |
| (3) Second Year Latin | | |
| (4) Cicero and Sight Translation..... | | 2. Latin B |
| (5) Virgil and Sight Translation..... | | 3. Latin C |

GREEK

- | | | |
|---|---|------------------|
| (a, i) Grammar..... | | 1. Greek A |
| (a, ii) Elementary Prose
Composition | } | 2. Greek B |
| (b) Xenophon | | |
| (c) Homer, Iliad, Books I-III..... | | 3. Greek C |

FRENCH

- | | |
|------------------------|-------------|
| (a) Elementary | 1. French A |
| (b) Intermediate | 2. French B |

GERMAN

- | | |
|------------------------|-------------|
| (a) Elementary | 1. German A |
| (b) Intermediate | 2. German B |

MATHEMATICS

- | | |
|--|------------------------|
| (a) Elementary Algebra Complete..... | 1. & 2. Algebra I & II |
| (a, i) Algebra, to Quadratics..... | 1. Algebra I |
| (a, ii) Algebra, Quadratics and beyond | 2. Algebra II |
| (c) Plane Geometry..... | 4. Plane Geometry |
| (d) Solid Geometry..... | 5. Solid Geometry |
| (f) Plane Trigonometry..... | 6. Plane Trigonometry |

PHYSICS

- | | |
|---------------|------------|
| Physics | 2. Physics |
|---------------|------------|

CHEMISTRY

- | | |
|-----------------|--------------|
| Chemistry | 1. Chemistry |
|-----------------|--------------|

EXAMINATIONS OF THE NEW YORK STATE BOARD OF
REGENTS

The Committee on Entrance may at its discretion accept the answer papers written by candidates in the examinations of the New York State Board of Regents, provided that

these papers have been re-read and passed by the examiners at Princeton.

ASIATIC STUDENTS

Any candidate for admission who is a native of Asia, and not of American or European parentage, may offer as a substitute for the regular requirement in Latin an equivalent in Arabic, Chinese, Sanskrit, or Pali. A candidate who wishes to make this substitution should notify the Registrar not later than March 1 of the year in which he plans to enter.

ADMISSION TO SPECIAL COURSES

In exceptional cases students are admitted to the privileges of the University, not as members of any one of the four regular classes or candidates for a degree, and are allowed to take special undergraduate courses, selected under the direction of the Faculty, in such a manner as to secure so full an employment of their time as in the regular course. Such special students are subject to the same regulations and discipline and to the same examinations in the studies pursued as other undergraduates. Any one desiring to enter as a special student is expected to take the regular entrance examinations upon the subjects prerequisite to his courses and to pass in a sufficient number of subjects to show that he has an amount of preparation equivalent to that required of regular students. These special courses, however, are not offered to those who attempt to enter the regular course and fail to do so, nor to those who have failed in the regular course.

When special students are finally leaving the University, certificates of proficiency, signed by the President and Registrar, may be granted them on report by the Committee on Examinations and Standing that they have completed the courses on their schedule.

STUDENTS PURSUING PARTIAL COURSES

Students in the Theological Seminary, or other properly qualified persons, may be admitted to one or more undergraduate courses in the University, paying \$16 per course each term. Such students shall be entered as undergraduates in the catalogue under the caption, Students Pursuing Partial Courses.

ADMISSION FROM OTHER COLLEGES

A candidate coming from another college to which he was admitted by certificate will be held for the Princeton freshman entrance requirements in each subject in which his standing in his former college was not in the upper half of his class. Such of these requirements as are not satisfied by examination at the time of admission must be satisfied in accordance with the rules which apply to students regularly admitted upon examination.

The candidate's credits for courses taken in the college from which he comes will be accepted in so far as these courses are equivalent to courses given at Princeton. If his credits show that he has an amount of preparation equivalent to that required of a regular freshman, he will be admitted and will be classified as a Student Qualifying for Regular Standing. He will be assigned to those courses for which he is qualified, preference being given to such of the required courses as he may not have had. If at the end of two terms of residence in Princeton his work has been satisfactory, he may be enrolled as a regular student, his status being determined by his credits; or, in case he qualifies for it, he may receive a degree with the graduating class. In the meantime he will be subject to the same regulations and discipline as a regular student.

No person is admitted to the University as a candidate for a Bachelor's degree, or for the degree of Civil Engineer, after the beginning of the first term of the senior year.

REGULATION CONCERNING SECRET SOCIETIES

Immediately after the beginning of the academic year the students entering the Undergraduate Department meet according to announcement for matriculation; and subscription to the following pledge is required by the Board of Trustees:

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no active connection whatever with any secret society, nor be present at the meetings of any secret society in this institution so long as we are members of Princeton University, it being understood that this promise has no reference to the American Whig and Cliosophic Societies. We also declare that we regard ourselves bound to keep this promise and on no account whatever to violate it.

PLAN OF UNDERGRADUATE STUDY

The courses of study offered to candidates for a bachelor's degree extend through four academic years, and lead to the degrees of Bachelor of Arts (A.B.), Bachelor of Letters (Litt.B.), and Bachelor of Science (B.S.). The degree of Bachelor of Arts (A.B.) is open to those who, entering with Greek, fulfill the full classical requirements of freshman and sophomore years; candidates for the degree being free, after the two introductory years, to choose their studies in whatever department they prefer, whether philosophical, literary, or scientific. The degree of Bachelor of Letters (Litt.B.) is open to those who, having substituted for Greek at entrance either French or German or one of those languages and physics or chemistry, concentrate their studies in junior and senior years in one of the philosophical, literary, political, or other humanistic departments. The degree of Bachelor of Science is open to those who, entering with a similar substitution for Greek, concentrate their studies in junior and senior years in one of the mathematical or scientific departments. The degree of Civil Engineer is conferred upon those who complete the full course in Civil Engineering, as outlined on succeeding pages.

The schedule of every sophomore, junior, and senior, who is a candidate for a bachelor's degree consists of five courses of three hours a week, subject only to the established exemptions for candidates for Final Special Honors.

The various courses of study offered are open only to students of that year to which the courses belong, except in cases where students are allowed or required to take a course belonging to a preceding year. A student not required to enroll in a course of a lower year than the one in which

he is ranked, and desiring to do so, is required to present to the Registrar the written permission of the instructor in charge of the course.

THE FRESHMAN YEAR

Candidates for the A.B. degree have in freshman year seventeen class exercises a week of which two are in English, four in Latin, four in Greek, four in Mathematics, and three in the modern language offered at entrance. Any candidate for the A.B. degree who passes either French B or German B at entrance may elect an advanced course in the subject passed by him, or may begin the other modern language which he did not offer for entrance.

Candidates for the Litt.B. or B.S. degree have seventeen class exercises a week of which two are in English, four in Latin, four in Mathematics, four in Physics or Chemistry, and three in a modern language.

A course in Hygiene, one hour a week, both terms, and a course in Physical Education, three periods a week, both terms, are also required of all freshmen, but the hours or periods of these courses are not to conflict with the hours already scheduled for each individual student in the curriculum.

FRESHMAN SCHEDULE

A.B.		Litt.B. or B.S.	
Greek	4 hours	Physics or Chemistry..	4 hours
Latin	4 "	Latin	4 "
Mathematics	4 "	Mathematics	4 "
English	2 "	English	2 "
Mod. Lang.	3 "	Mod. Lang.	3 "
Hygiene	1 "	Hygiene	1 "
Physical Education....	3 "	Physical Education....	3 "
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21		21	

THE SOPHOMORE YEAR

The sophomore courses, required and elective, arranged so as to include elementary courses prerequisite to the subsequent studies of the various departments, are as follows. Sophomore electives are to be chosen for the entire year:

SOPHOMORE A.B.—REQUIRED

Introduction to Philosophy
Greek (1st term); Latin (2nd term)
Physics or Chemistry

SOPHOMORE A.B.—ELECTIVE (*Two courses to be taken*)

History
Latin (1st term); Greek (2nd term)
French (Advanced or Beginners')
German (Advanced or Beginners')
Spanish or Italian
English
Mathematics
Physics
Chemistry
Biology

SOPHOMORE B.S. AND LITT.B. [for students who have taken Physics in Freshman Year]

REQUIRED

Introduction to Philosophy
Two of
Latin, Mathematics, Physics (second course)
or Chemistry (first course)

ELECTIVE (*Two courses to be taken*)

History
Latin
French (Advanced or Beginners')
German (Advanced or Beginners')
Spanish or Italian
English
Mathematics
Physics (second course)
Chemistry (first course)
Biology (with Chemistry)
Graphics, if Mathematics is taken

SOPHOMORE B.S. AND LITT.B. [for students who have taken Chemistry in Freshman Year]

REQUIRED

Introduction to Philosophy

Two of

Latin, Mathematics, Physics (first course),
or Chemistry (second course)

ELECTIVE (*Two courses to be taken*)

History

Latin

French (Advanced or Beginners')

German (Advanced or Beginners')

Spanish or Italian

English

Mathematics

Physics (first course)

Chemistry (second course)

Biology

Graphics, if Mathematics is taken

The Honors Course in Mathematics and Physics, which formerly began in sophomore year, begins in junior year. The sophomore courses in Mathematics and Physics are preliminary to this Honors Course.

The student's choice of a department for junior and senior years is to some extent conditioned by his selection of electives in the sophomore year.

THE JUNIOR AND SENIOR YEARS

Every junior and senior in candidacy for a bachelor's degree is enrolled either under the general plan of study, taking five three-hour courses, or as a candidate for Final Special Honors, taking four three-hour courses, and in either case must take at least two three-hour courses in some one department. The regulations for Final Special Honors are given in the section entitled "Honors" on a later page.

In choosing their electives for junior or senior year

students shall hand in to the Registrar their choices for both terms.

LIST OF COURSES OF JUNIOR YEAR

[The numbers prefixed to the courses in the following list refer to the description of those courses on later pages. All courses three hours a week. Five courses to be taken. First term courses have odd numbers: second term courses have even numbers.]

A. DIVISION OF PHILOSOPHY

I. *Department of Philosophy*

- 301, 302. History of Philosophy
- 303. Advanced Psychology. 304. Advanced Logic or 306. Genetic Psychology
- 305. Ethics (first term)
- 312. Plato (second term)
- (*Advised elective*: 303, 304. Politics)

II. *Department of History and Politics*

- 301, 302. European History or 305, 306. Roman History
- 303. Constitutional Government
- 304. Jurisprudence
- (*Requisite cognate course*: 305, 306. Economics)
- (*Advised elective*: 301, 302. History of Philosophy)

III. *Department of Economics and Social Institutions*

- 305, 306. Elements of Economics
- 307, 308. Historical and Descriptive Economics
- (*Requisite cognate course*: 303, 304. Constitutional Government and Jurisprudence)

IV. *Department of Art and Archaeology*

- 301. Ancient Art. 302. Mediaeval Art
- 303, 304. Ancient and Mediaeval Architecture

B. DIVISION OF LANGUAGE AND LITERATURE

V. *Department of Classics*

- 317, 318. Latin Literature
- 307. Cicero's Letters. 316. Plautus.
- 313. Aeschylus and Sophocles. 310. Greek Lyric Poets
- 311. Homer. 312. Plato
- (*Advised elective*: 301, 302. History of Philosophy)

Honors Courses in Classics

317, 318. Latin Literature

305, 306. Roman History

313. Aeschylus and Sophocles. 310. Greek Lyric Poets

311. Homer. 312. Plato

VI. *Department of English*

301. English Literature (16th century). 302. Shakespeare

303. English Philology. 304. Elementary Old English

VIIa. *Department of Modern Languages. Germanic Section*

301, 302. German Literature (Opitz to Lessing)

303, 304. German Literature (Goethe)

VIIb. *Department of Modern Languages. Romanic Section*

301, 302. French Literature (17th century)

305, 306. Italian or 307, 308. Spanish

(Advised elective: 317, 318. Latin Literature)

C. DIVISION OF MATHEMATICS AND SCIENCE

VIII. *Department of Mathematics*

301, 302. Analytic Solid Geometry; Differential Equations

303, 304. Analytical Mechanics

Honors Course in Mathematics and Physics

A. Pure Mathematics—Geometry

B. Pure Mathematics—Analysis

C. Applied Mathematics—Mechanics

D. Theoretical Physics

E. Experimental Physics

IX. *Department of Physics*

301, 302. Experimental Physics

303, 304. Analytical Mechanics

(Advised elective: 301, 302. Mathematics)

X. *Department of Chemistry*

Two courses throughout year required:

301, 302. Qualitative Analysis or 307, 308. Quantitative Analysis

305, 306. Organic Chemistry or 309, 310. Physical Chemistry

311. Historical and Theoretical Chemistry (elective)

XI. *Department of Geology*

301. Geology. 302. Structural Geology

303, 304. Mineralogy

306. General Palaeontology (exclusive with Mineralogy 304)
(Requisite cognate course: Biology through the year, or Chemistry through the year, or Graphics 203 and Geodesy 304)

XII. *Department of Biology*

201, 202. General Biology

303, 304. Botany

305. Comparative Osteology; 306. Invertebrate Zoölogy (if Biology 201, 202 has been taken)

(Requisite cognate course: Chemistry 303, 304 through year)

Junior courses which are not included in any one of the departments above:

301. Elementary Astronomy; 302. Stellar Astronomy

304. Geodesy

302. Graphics

303. Graphics

304. Graphical Statics

302. Physical Geography

LIST OF COURSES OF SENIOR YEAR

[All courses three hours a week. Five courses to be taken. First term courses have odd numbers; second term courses have even numbers.]

A. DIVISION OF PHILOSOPHY

I. *Department of Philosophy*

401, 402. Philosophy of Religion

403a. Experimental Psychology or 403b. Fundamental Problems of Philosophy (1st term)

404. Experimental Psychology (2nd term) (exclusive with any one of 2nd term electives in Philosophy)

405. Types of Ethical Theory (1st term)

407. Greek Philosophy (1st term)

410. Philosophy of the 19th century (2nd term)

II. *Department of History and Politics*

401, 402. English History

403, 404. American History

- 405. Municipal Government
- 406. Federal and State Government
- 407, 408. International Law and Diplomacy
- 411. Constitutional Interpretation; 412 Administrative Law
- 419, 420. Roman Law

III. *Department of Economics and Social Institutions*

- 409. Money and Banking; 410, Public Finance
- 411. European Economic Policy (1st term)
- 414. Social Economics (2nd term)

IV. *Department of Art and Archaeology*

- 401. Italian Sculpture; 402. Greek Sculpture
- 405. Italian Painting; 406. Northern Painting
- 407, 408. Elements of Architecture

B. DIVISION OF LANGUAGE AND LITERATURE

V. *Department of Classics*

- 401. Lucretius; 412. Virgil
- 419, 420. Roman Law
- 415. Aristophanes; 416. Classical Influences
- Honors Course in Classics*
- 401. Lucretius; 412. Virgil
- 405. Cicero; 414. Tacitus
- 419, 420. Roman Law
- 403, 404. Greek History
- 409. Thucydides; 410. Aristotle
- 416. Classical Influences (second term)

VI. *Department of English.*

- 401. English Literature (Restoration and 18th century);
- 402. English Literature (17th century)
- 403, 404. English Literature (19th century)
- 405. Advanced Old English; 406. Chaucer
- 416. Classical Influences in English Literature (second term)

VIIa. *Department of Modern Languages. Germanic Section*

- 401, 402. German Literature (19th century)
- 403, 404. German Literature (Middle High German)

VIIb. *Department of Modern Languages. Romantic Section*

- 401, 402. French Literature (Romantic Movement)
- 403, 404. Old French
- 405, 406. French Literature (18th and 16th centuries)

- 407, 408. Italian Literature
409, 410. Spanish Literature

C. DIVISION OF MATHEMATICS AND SCIENCE

VIII. *Department of Mathematics*

- 401, 402. Calculus and Higher Algebra
403, 404. Theoretical Physics (Electricity and Magnetism)

Honors Course in Mathematics and Physics

- a. Geometry or Algebra
b. Analysis
c. Applied Mathematics: Electricity and Magnetism
d. Theoretical Physics
e. Experimental Physics
f. Celestial Mechanics

IX. *Department of Physics*

- 401, 402. Theoretical Physics (Light and Heat)
403, 404. Theoretical Physics (Electricity and Magnetism)

X. *Department of Chemistry*

Two courses throughout year required:

- 307, 308. Quantitative Analysis, if not already taken
305, 306. Organic Chemistry or 309, 310. Physical Chemistry
(the one not taken in junior year)

Electives:

- 401, 402. Quantitative Analysis
403, 404. Organic Chemistry
405, 406. Physical Chemistry

XI. *Department of Geology*

- 401, 402. Historical Geology
403. Structural and Dynamic Geology; 404. Economic Geology
405, 406. Invertebrate Palaeontology, or
407. Mineralogy; 408. Petrology

XII. *Department of Biology*

401. Comparative Anatomy of Vertebrates; 402. Embryology
403. Histology. 404. Histology, or 406. Palaeontology
407, 408. Physiology

Senior courses which are not in any one of the departments above :

- 401, 402. Sanskrit
- 403, 404. Biblical Literature
- 405, 406. Biblical Literature
- 408. History of Greek Science (2nd term)
- 403. Practical Astronomy (1st term)
- 401. Graphics (1st term)
- 403, 404. Theory of Prime Motors

METHOD OF UNDERGRADUATE INSTRUCTION

Instruction in Physics, Chemistry, Biology, and Astronomy is given, of course, not only by means of lectures and formal tests upon textbooks, but also by means of practical experimental work in the several laboratories and in the working observatory. In Mathematics, besides the stated class exercises and occasional lectures, certain hours are set apart each week during which the instructors of the department are accessible for informal consultation by all students who wish further explanation or discussion of such portions of their mathematical work as most interest them or give them the most difficulty. In Geology, similarly, there is field work and constant informal resort to the geological museum, added to frequent conferences with the instructors in the several courses on the reading assigned.

Instruction in what may be called the reading departments, Philosophy, History and Politics, Economics and Social Institutions, Art and Archaeology, and the languages is given chiefly by means of informal conferences on the reading assigned. A "course" consists, not of the lectures given in connection with it or of the study of a particular textbook relied on by the lecturer, but of a prescribed body of reading to which the lectures given are supplementary. Each student is made responsible to a particular preceptor

for his reading, and reports to him once a week in each course for conference.

At each conference the preceptor usually meets from three to six of the men assigned him. The methods of conference differ, of course, with the character of the subject, but are always informal, being intended, not as a quiz or recitation or drill, not as a method of coaching, but, so far as the preceptor is concerned, as a means of finding out how thoroughly and intelligently the student has done his reading, and, so far as the student is concerned, as a means of stimulation and enlightenment with regard to the study in hand. His work is explained to him where it is obscure, and its scope and implications are extended out of the wider reading and maturer scholarship of the preceptor, whose real function it is to serve him as "guide, philosopher, and friend." Study centers upon these conferences, as in the scientific departments it centers upon the laboratory. They are meant to supply to study the life which it cannot have in the formal exercises of the classroom and to bring the students into an intimate contact with their teachers which is hardly possible in other methods of instruction.

One object of this method of instruction is to lay the principal emphasis of work upon the constant reading required, upon what is ordinarily called "term work," rather than upon preparation for occasional examinations. In reckoning the "standing" of a student more weight is given to his work with his preceptor than to his performance in examination. Each preceptor is expected to report in departmental meeting upon the work of the men assigned him, and it is only upon his recommendation that they are admitted to examination. He may recommend the exclusion from examination of any of his pupils who seem to him to have neglected their work or to have done it too indifferently. He makes no formal report to any uni-

versity officer of their absences from his appointed conferences or of their attendance, but forms his own estimate of their thoroughness and faithfulness and gives his judgment upon the basis of an intimate observation.

All members of the Faculty do "preceptorial" work: those who lecture or conduct the formal class exercises acting as preceptors as well as those who devote the principal part of their time to this special method of teaching.

DEPARTMENT OF CIVIL ENGINEERING

THE COURSE OF STUDY

The course in civil engineering is designed to fit its graduates for entering the profession of civil engineering. The degree conferred at its close on successful candidates is Civil Engineer (C.E.). The regular course of study occupies four years, but applicants who are found to be suitably prepared are admitted to advanced standing. Bachelors of Arts, of Letters, or of Science of Princeton University, who, while undergraduates, have pursued suitable elective studies can ordinarily be prepared for the civil engineer's degree by a two-year's course in the technical studies required for that degree.

In arranging the course in civil engineering care has been taken to give the student the benefit of as much general training in the earlier years as the claims upon his time made by his later technical studies will permit. Accordingly, a large proportion of his time in freshman and sophomore years is devoted to studies which are pursued in common with candidates for the bachelor's degree.

A very large proportion of the strictly technical studies of the course cannot be profitably pursued without a thorough previous preparation in mathematics; especial attention is therefore given in the earlier part of the course to imparting to the students in civil engineering a sound working knowledge of the ordinary divisions of that science, inclusive of analytical mechanics, and a high degree of proficiency therein is exacted from all candidates for the degree of C.E.

Great stress is also laid in this course on the study of graphics as a science as well as an art, both in its general development and in its application to the practice of designers and builders. For convenience, it has been separated into two distinct divisions. viz.:

A. Defined in detail under the courses entitled Graphics (under Department of Civil Engineering, on a later page), and comprising all branches of the study, including descriptive geometry and its applications, which are usually grouped under the general heading, geometrical or mechanical drawing. At its conclusion the student will have been trained to execute general and working drawings of structures, to prepare patterns or templates for the shaping of structural details, to make working and finished drawings of machines, and to trace graphically and lay out mechanical movements, such as link-and-valve motions, etc.

B. Defined in detail in the courses entitled Geodesy (under Department of Civil Engineering, on a later page), and consisting of those branches of the art which are closely associated with surveying, and generally known as map drawing or topographical drawing, the object of which is to make the student expert in the execution, in pen work and colors, of finished plans and maps of various kinds of surveys. Except in the necessary preliminary drill these drawings invariably represent actual surveys made by the different classes. A rigid adherence to field notes and a high degree of finish are exacted in their execution.

The study of surveying and engineering field work is provided for in the different subdivisions of the course of study in Geodesy (see courses in Geodesy, under Department of Civil Engineering, on a later page). The structure, adjustment, and use of each instrument are made subjects of special attention, and no student is allowed to participate in any extended field operation until he has acquired a certain dexterity in handling the instruments used therein. The instruction in geodesy extends through different kinds of surveys, in the order of their complexity, and ends in location surveys of lines of communication, staking out for construction in general, and problems of railway terminals

and yard-work. A special feature of the course in geodesy is the stress laid on the orderly collection and verification of field notes by each student, and on their appropriate use in the preparation of different kinds of plans, maps, and charts of surveys. No error is allowed in field work or in plotting which is not within the limits of observed practice.

During the two weeks immediately following the close of the second term of the junior year, the junior class in civil engineering engages in the field work of extended surveys in some locality selected by the Professor of Geodesy. All regular members of the class are required to attend these exercises.

The remaining strictly technical studies of the course in civil engineering, given by name on succeeding pages, may be grouped under the headings: applied mechanics, constructions, and laboratory practice.

The first group covers a wide range of studies comprising graphical statics, theoretical and practical hydraulics, the elasticity and strength of materials, the stability and pressures of earthen masses and of foundations, the stability of block structures and of steel-concrete structures, the strength of girders and of framed structures, the theory of the draw bridge, the suspension bridge, the cantilever bridge, and of metallic arches, the general theory of motors, and the theory of water wheels, of steam engines, and gas engines. In dealing with the theories of these subjects rigid mathematical treatment is generally used, yet proper weight is given to graphical methods of analysis and the student's attention is especially directed to those problems in which such methods can be employed with advantage. The practical application of the above subjects also receives proper attention and is illustrated in some cases by drawings, in others by models, and in others by prescribed exercises in the Civil Engineering Laboratory.

The second group, namely constructions, comprises those technical studies which are largely descriptive of the planning and construction of engineering works. These subjects begin with the study of the physical properties of structural materials, with the aid of laboratory exercises, and advance to the study of the design and construction of foundations under various conditions of difficulty; to the erection of bridges and other structures, and the consideration of the auxiliaries needed therefor; to the planning and construction of water works under different conditions as to kind and quality of supply; the design and construction of sewerage and drainage systems, including modes of disposal and purification of sewage; and the construction of roads, streets, etc. Great stress is laid on the application of correct rules and principles, on the careful inspection, manipulation, and preservation of materials, and on the economic features of various designs and the modes of executing them.

The position of the third group of exercises, namely laboratory practice, in the course of study, as well as its purpose, will be inferred from the preceding explanations.

As one of the conditions of being recommended for the degree of Civil Engineer each candidate for the degree is required to prepare and submit for the approval of a professor, appointed in each case by the department, a graduation thesis. This shall be a design or review of some structure, machine, or process, or a theoretical and practical examination and extension of some work or subject selected from the technical studies of the department. The subject of the graduation thesis must be announced for approval to the professors of the department, not later than the first Monday in March (second term, senior year); and the thesis must be completed on or before the second Saturday preceding Commencement.

The following is a synopsis of the course in civil engineering. *All studies are required.*

THE FRESHMAN YEAR

<i>First Term</i>		<i>Second Term</i>	
English	2	English	2
Physics	4	Physics	4
Mathematics	4	Mathematics	4
Chemistry	4	Chemistry	4
Graphics	2	Geodesy	3
Geodesy	1	Hygiene	1
Hygiene	1	Physical Education	3
Physical Education.....	3		
	—		—
Total	21	Total	21

THE SOPHOMORE YEAR

<i>First Term</i>		<i>Second Term</i>	
General Physics	3	General Physics	3
Mathematics	3	Mathematics	3
Mathematics	2	Mathematics	2
Mineralogy	3	Geology	3
Graphics	3	Graphics	3
Geodesy	3	Geodesy	3
	—		—
Total	17	Total	17

THE JUNIOR YEAR

<i>First Term</i>		<i>Second Term</i>	
Analytical Mechanics	3	Analytical Mechanics	3
General Astronomy	3	Practical Astronomy	2
Graphical Statics	3	Mechanics of Materials.....	4
Geodesy	4	Geodesy	5
Graphics	2	Graphics	3
Materials of Construction ...	2		
	—		—
Total	17	Total	17

THE SENIOR YEAR

<i>First Term</i>		<i>Second Term</i>	
Framed Structures	5	Framed Structures	3
Prime Motors	3	Prime Motors	3
Hydraulics	2	Water Works	2
Graphics	2	Sewerage and Drainage	2
Geodesy	3	Roads	2
Laboratory	2	Masonry Structures	2
		Methods of Construction....	2
		Laboratory	1
	—		—
Total	17	Total	17

*COURSES OF INSTRUCTION

A. DIVISION OF PHILOSOPHY

I. DEPARTMENT OF PHILOSOPHY

THE PRESIDENT, PROFESSORS PATTON, WARREN, KEMP SMITH, JOHNSON, BOWMAN, SPAULDING, FOGEL, WHITNEY, MC COMAS, AND HOCKING; MR. BAXTER, MR. REEVES, AND MR. MELVILLE

201. Introduction to Philosophy, with collateral reading and conferences in Logic and Ethics. Hibben: *Logic, Deductive and Inductive*. Sophomore required course, first term, 3 hours a week. Lecturer, Professor Bowman; Instructors, Professors Bowman, Johnson, Spaulding, Whitney, Fogel, and Mr. Baxter.
202. Introduction to Philosophy: Psychology and General Philosophy. Sophomore required course, second term, 3 hours a week. Lecturer, Professor Kemp Smith; Instructors, Professors Kemp Smith, Johnson, Spaulding, Whitney, Fogel, and Mr. Baxter.
301. History of Philosophy. This course includes (1) Greek and Roman philosophy to close of pagan schools. (2) Mediaeval philosophy to fall of scholasticism and beginning of the modern era. Preceptorial reading. Junior course, first term, 3 hours a week. Prerequisite to History of Philosophy of second term. Lecturer, Professor Bowman; Preceptors, Professors Fogel and Whitney, and Mr. Baxter.

* Courses between 101 and 200 are for freshmen, between 201 and 300 for sophomores, between 301 and 400 for juniors, and between 401 and 500 for seniors.

302. History of Philosophy. This course includes modern philosophy from Descartes to Kant. Lectures, accompanied with preceptorial reading. Junior course, second term, 3 hours a week. Prerequisite course: History of Philosophy of first term. Lecturer, Professors Bowman; Preceptors, Professors Johnson, Fogel, and Whitney, and Mr. Baxter.
303. Psychology. Lectures and preceptorial reading. Junior course, first term, 3 hours a week. Lecturer, Professor Johnson; Preceptors, Professors Johnson and McComas.
304. Advanced Logic. Lectures and preceptorial conferences. Junior course, second term, 3 hours a week. Exclusive with 306. Professor Bowman.
306. Genetic Psychology. Development and evolution of consciousness in man and the lower species; psychological application of the theory and laws of organic evolution. Lectures and collateral reading. Junior course, second term, 3 hours a week. Exclusive with 304. Lecturer, Professor Warren; Preceptors, Professors Warren, Johnson, and McComas.
305. Ethics, with particular reference to the practical problems of individual and social life. Junior course, first term, 3 hours a week. Lecturer, the President; Preceptors, Professors Fogel and Whitney, and Mr. Baxter.
- *401, *402. Introduction to the Philosophy of Religion Topics: The psychological and epistemological roots of religion; fundamental religious ideas; theism and its problems. Senior course, both terms, 3 hours a week. Lectures and preceptorial reading. Lecturer, Professor Hocking; Preceptors, Professors Fogel and Whitney.

* Also listed as graduate course.

- 403a. Experimental Psychology. Introductory course. Psychological methods, analysis of sensation, reaction, and study of the common senses. Lectures and work in the laboratory. Senior course, first term, 3 hours a week. Exclusive with 403b. Lecturer, Professor Warren. Laboratory, Professor Warren and Mr. Reeves.
- *403b. Fundamental Problems of Philosophy. Discussion, historical and systematic, of the main current topics of philosophy, materialism, agnosticism, idealism. Marvin: *First Book of Metaphysics*. Karl Pearson: *The Grammar of Science*. Previous knowledge of technical metaphysics is not required. Senior course, first term, 3 hours a week. Exclusive with 403a. Prerequisite to 410. Professor Kemp Smith. [Given in 1913-1914 by Professor Spaulding.]
404. Experimental Psychology. Continuation of 403a. Special senses; space perception and illusions; higher intellectual processes. Lectures and work in the laboratory. Senior course, second term, 3 hours a week. Professor Warren.
- *405. Types of Ethical Theory. Lectures on the history of ethics and types of ethical theory with collateral reading. Senior course, first term, 3 hours a week. Professor Patton.
- *407. History of Greek Philosophy. Lectures and collateral reading. Detailed study will be made of the Pre-Socratic fragments, and of some of the chief works of Plato and Aristotle. History of Philosophy 301 should, if at all possible, be previously taken in Junior year. Senior course, first term, 3 hours a week. Professor Bowman.
- *410. History of Philosophy. The origins and tendencies of

* Also listed as graduate course.

Nineteenth Century thought. This course is designed as an historical introduction to the chief philosophical systems of the Nineteenth Century. Previous knowledge of technical metaphysics is not required. Senior course, second term, 3 hours a week. Professor Kemp Smith.

For regulations regarding Final Special Honors in Philosophy see page 119.

For graduate courses in Philosophy, see the University Catalogue, pages 236 to 238.

II. DEPARTMENT OF HISTORY AND POLITICS

PROFESSORS PAUL VAN DYKE, WESTCOTT, FORD, ELLIOTT, MC ELROY, CORWIN, WILLOUGHBY, SHIPMAN, SPENCER, MYERS, BROWN, LINGELBACH; DR. WERTENBAKER, MR. HERRING, DR. MAGRUDER, MR. WINSTON, DR. HALL, MR. KNIPFING, MR. STEPHENSON, DR. TYLER, AND MR. WOOD

- 201, 202. Mediaeval History; 400 A.D.—1404 A.D. Sophomore elective, both terms, 3 hours a week. One lecture weekly by Professor Paul van Dyke, and two recitations weekly in small divisions, the recitations being conducted by Mr. Herring, Mr. Knipfing, Mr. Stephenson, and Mr. Wood. (This course is to precede and be continuous with History 301 and 302.)
301. European History; 1494 A.D.—1789 A.D. Lectures and required reading. Junior course, first term, 3 hours a week. Lecturer, Professor Lingelbach; Preceptors, Professor Shipman, Dr. Wertenbaker, Mr. Winston, Dr. Hall, and Dr. Tyler.
302. European History; 1789 A.D.—1878 A.D. Lectures and required reading. Junior course, second term, 3

hours a week. Lecturer, Professor Lingelbach; Preceptors, Professor Shipman, Dr. Wertenbaker, Mr. Winston, Dr. Hall, and Dr. Tyler.

303. Constitutional Government. The genesis, nature, and operation of constitutional government, with especial reference to the political institutions of England and the United States. W. Wilson: *Constitutional Government*; Ogg: *The Governments of Europe*; Lowe: *The Governance of England*. Junior course, first term, 3 hours a week. Lecturer, Professor Willoughby; Preceptors, Mr. Herring, Dr. Magruder, Dr. Hall, Mr. Knipfing, Mr. Stephenson, and Dr. Tyler.
304. Elements of Jurisprudence. Outlines of jurisprudence. An exposition of jurisprudence as an organic whole, exhibiting the nature of its subject-matter, its relationship to cognate branches of study, the inter-relationship of its several parts to each other, and their proper function and aim. Lectures and collateral reading. T. E. Holland: *Elements of Jurisprudence*; Sir H. S. Maine: *Ancient Law*; and other reading. Junior course, second term, 3 hours a week. Lecturer, Professor Willoughby; Preceptors, Mr. Herring, Dr. Magruder, Dr. Hall, Mr. Knipfing, Mr. Stephenson, and Dr. Tyler.
- 401, 402. Modern English History from the accession of the Tudor Dynasty to the Electoral Reforms of the Nineteenth Century. The lectures in this course are given twice weekly by Professor Paul van Dyke. Lectures, collateral reading and tests. Senior course, both terms, 3 hours a week. Lecturer, Professor van Dyke; Preceptor, Dr. Wertenbaker.
403. American History to the Fall of the Federalist Party. An account of the discovery of the continent, the growth of colonial institutions, the development of

concerted action among the colonies, and the establishment of the federal government. Lectures dealing with selected topics; textbook covering the entire period; and extensive collateral reading. Senior course, first term, 3 hours a week. Lecturer, Professor McElroy; Preceptors, Professor Spencer, Professor Myers, Dr. Wertenbaker, Mr. Winston, and Mr. Wood.

404. American History since the fall of the Federalist Party. An account of the development and expansion of the United States. Lectures dealing with selected topics; textbook covering the entire period; and extensive collateral reading. Senior course, second term, 3 hours a week. Lecturer, Professor McElroy; Preceptors, Professor Spencer, Professor Myers, Dr. Wertenbaker, Mr. Winston, and Mr. Wood.
405. Politics. Municipal Government in the United States and other countries. Senior course, first term, 3 hours a week. Lecturer, Professor Ford; Preceptors, Professors Spencer, Shipman, and Myers, and Dr. Magruder.
406. Politics. Federal and State Government. An examination of the way in which public policy is formulated and the public business is carried on in the United States, tracing the divergence from English procedure and comparing existing methods with those of other self-governing countries. Lectures and collateral reading. Senior course, second term, 3 hours a week. Lecturer, Professor Ford; Preceptors, Professors Spencer, Shipman, and Myers, and Dr. Magruder.
- 407, 408. Politics. International Law and Diplomacy. A discussion of the general principles with their application to some current and disputed questions. Lawrence: *Principles of International Law*; Scott:

- Cases on International Law.* Senior course, both terms, 3 hours a week. Professor Brown.
411. Politics. History of Constitutional Interpretation in the United States. A study of the development of the leading doctrines of American Constitutional Law, principally by judicial decision. Lectures, cases, collateral reading. Senior course, first term, 3 hours a week. Professor Corwin.
412. Administrative Law. Senior course, second term, 3 hours a week. Professor Corwin. [Not given, 1913-1914].
- *419, 420. (Classics 419, 420) Roman Law. The History and Institutes of Roman Law. Sohm: *Institutes of Roman Law*, English translation. Leage: *Roman Private Law*. Special attention will be given to the law of obligations. Students in the Department of Classics, and others who desire to do so, will read the Institutes of Gaius and of Justinian in Latin. Senior course, both terms, 3 hours a week. Professor Westcott.
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For Honors courses in the Classical Humanities which may be substituted for regular courses in this department see under the Department of Classics.

THE PRO-SEMINARY. In the Department of History and Politics, a pro-seminary is conducted both terms. Admission to the pro-seminary is conditioned upon a student's obtaining in the junior year courses of the department the standing prescribed for entrance upon pro-seminary work. Professor McElroy is the general director of the pro-seminary.

For the year 1913-1914 the Seminary in History will be conducted by Mr. Winston and Dr. Wertenbaker or Professor Spencer.

* Also listed as graduate course.

For regulations regarding Final Special Honors in History and Politics, see page 120.

For graduate courses in History and Politics, see the University Catalogue, pages 238 to 241.

III. DEPARTMENT OF ECONOMICS AND SOCIAL INSTITUTIONS

PROFESSORS FETTER, KEMMERER, MC CLELLAN, ADRIANCE, AND
MC CABB; MR. KNAUTH AND MR. RIFE

- 305, 306. Elements of Economics. This course will comprise the fundamental theories of economics and some of their more important applications and exemplifications, such as money, banking, transportation, international trade, and monopoly problems. -One lecture a week (by Professor Fetter) and two recitations in small groups to test the student's apprehension of the subject matter covered in the reading. Fetter: *Principles of Economics*, and *Source Book in Economics*. Junior course, both terms, 3 hours a week. Prerequisite course: History 202. Prerequisite to Economics 409, 410, 411, 414. Professors Fetter, Adriance, and McCabe, and Mr. Rife.
- 307, 308. Historical and Descriptive Economics. A study of the main lines of English and American industrial development. Especial attention to critical periods which best illustrate economic principles; with a description of some important conditions of industry in the present day and more detailed study of some practical problems. Junior course, both terms, 3 hours a week. Open only to departmental students. Professors McCabe and Fetter.
409. Money and Banking. This course is designed to outline briefly the problems touching money and banking. Johnson: *Money and Currency*; Dunbar: *History*

and Theory of Banking; Fiske: *Modern Bank*, and Escher: *Foreign Exchange*. Senior course, first term, 3 hours a week. Prerequisite courses: History 202 and Economics 305 and 306. Lecturer, Professor Kemmerer; Preceptors, Professors Kemmerer, and Adriance, and Mr. Rife.

410. Public Finance. This course covers the theory of public finance, and a number of its practical applications. Lectures with weekly conferences. Daniels: *Public Finance*, and other collateral reading. Senior course, second term, 3 hours a week. Prerequisite courses: History 202 and Economics 305, 306. Lecturer, Professor Adriance (in 1913-1914); Preceptors, Professor Adriance, Mr. Knauth, and Mr. Rife.
411. European Economic Policy in the 19th Century. An account of some of the important political events in Europe since 1815, in connection with social conditions and industrial changes. Senior course, first term, 3 hours a week. Prerequisite courses: History 202 and Economics 305, 306. Professor McClellan.
414. Social Economics. A study of the principles and methods now being applied in bettering physical and moral conditions of industrial life and in the prevention and treatment of crime and dependency. Lectures, with collateral readings, visits to industrial and philanthropic institutions in the vicinity, and reports and conferences on assigned problems. Senior course, second term, 3 hours a week. Prerequisite courses: History 202 and Economics 305, 306. Lecturer, Professor Fetter; Preceptor, Mr. Knauth.

For regulations regarding Final Special Honors in Economics and Social Institutions, see page 121.

For graduate courses in Economics, see the University Catalogue, pages 241 to 243.

IV. DEPARTMENT OF ART AND ARCHAEOLOGY

PROFESSORS MARQUAND, BUTLER, MATHER, MOREY, AND
ELDERKIN; MR. WARD

301. Ancient Art. A general outline of the history of ancient sculpture, painting, and the minor arts. Lectures and required reading. Reference books: Maspero: *Egyptian Archaeology*; Babelon: *Oriental Antiquities*; Fowler and Wheeler: *Greek Archaeology*. Junior course, first term, 3 hours a week. Lecturer and Preceptor, Professor Elderkin.
302. Mediaeval Art. A general outline of the history of Early Christian, Byzantine, Romanesque, and Gothic sculpture, painting, and the minor arts. Lectures and required reading. Reference book: Lowrie: *Monuments of the Early Church*. Junior course, second term, 3 hours a week. Lecturer and Preceptor, Professor Morey.
303. Ancient Architecture. A course in the history of Egyptian, Assyrian, Persian, Greek, and Roman architecture. Two hours of lectures and one of historical drawing and reading. Reference books: Hamlin: *History of Architecture*; Sturgis: *History of Architecture*, Vol. I; Anderson and Spiers: *The Architecture of Greece and Rome*. Junior course, first term, 3 hours a week. Prerequisite to 407, 408, Elements of Architecture. Lecturer, Professor Butler; Preceptors, Professors Butler and Elderkin.
304. Mediaeval Architecture. The history of Early Christian, Byzantine, Romanesque, and Gothic architecture. Two hours of lectures and one of historical drawing. Reference books: Porter: *Mediaeval Architecture*; Moore: *Mediaeval Church Architecture in England*. Moore: *Gothic Architecture*. Junior course, second term, 3 hours a week. Prerequisite course: Ancient Architecture 303. Lecturer, Profes-

sor Butler; Preceptors, Professor Butler and Mr. Ward.

- *401. Italian Sculpture. A general survey of the history of Italian sculpture through the Renaissance period. Lectures and required reading. Senior course, first term, 3 hours a week. Prerequisite course: one of the Junior courses in Art and Archaeology. Lecturer, Professor Marquand; Preceptors, Professor Marquand and Mr. Ward.
- *402. Greek Sculpture. A study of the technique, forms, composition, and history of Greek sculpture. Lectures and required reading. Gardner: *Handbook of Greek Sculpture*. Senior course, second term, 3 hours a week. Prerequisite course: Ancient Art 301. Lecturer and Preceptor, Professor Elderkin.
- *405. The Revival of Painting in Italy. An outline history of painting in Italy from Cavallini to Michelangelo, with especial regard to the Florentine School. Wölfflin's *Art of the Renaissance* will be used, and the development of style in painting will be associated with the corresponding changes in culture. Senior course, first term, 3 hours a week. Prerequisite course, one of the Junior courses in Art and Archaeology. Lecturer and Preceptor, Professor Elderkin.
- *406. Northern Painting. Especial attention will be given to the Flemish school, but the chief painters of the German and Dutch schools will be studied and a few lectures on typical French and English masters of the nineteenth century will treat of the leading modern tendencies in the light of their historic origins. Senior course, second term, 3 hours a week. Prerequisite course: one of the Junior courses in Art and Archaeology. Lecturer and Preceptor, Professor Mather.

* Also listed as graduate course.

- *407, 408. Elements of Architecture. The classic orders of ancient and Renaissance architecture, studied in their historical development, from reproductions of the ancient monuments, from the text of Vitruvius, and from the works of Vignola and Palladio. This course includes drawing to scale, with shades and shadows, and exercises in historical design. Ware: *The American Vignola*. Senior course, both terms, 3 hours a week. Prerequisite course: Ancient Architecture 303. Professor Butler and Mr. Ward.
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For regulations regarding Final Special Honors in Art and Archaeology, see page 121.

For graduate courses in Art and Archaeology, see the University Catalogue, pages 243 to 246.

* Also listed as graduate course.

B. DIVISION OF LANGUAGE AND LITERATURE

V. DEPARTMENT OF CLASSICS

DEAN WEST, PROFESSORS WESTCOTT, ROBBINS, PRENTICE, CAPPS,
STUART, ABBOTT, DAVID MAGIE, JR., BASORE, HUTSON,
HARMON, VAN DEVENTER, FOX, AND JOHNSON; DR.

CARY, DR. MIEROW, DR. DURHAM, MR. SCOON,
MR. RUTH, DR. HARRER, AND MR.

STRINGFELLOW

FRESHMAN AND SOPHOMORE YEARS

101. Herodotus. Selected portions of Herodotus will be read by the whole class. Divisions I-II will devote one hour a week to the study of Greek history and institutions, extending from early times down to the close of the Persian Wars. In Divisions III-VI one hour a week will be utilized for exercises in Greek prose composition. Freshman course, required for the degree of A.B., first term, 4 hours a week. Professors Stuart, Hutson, Harmon, Johnson; Dr. Cary, Dr. Durham, Mr. Scoon, and Mr. Stringfellow.
102. Thucydides and Demosthenes. Parts of Thucydides and the Philippics of Demosthenes will be read. Divisions I-II will devote one hour a week to the study of Greek history and institutions down to the death of Alexander. In Divisions III-VI one hour a week will be utilized for exercises in Greek prose composition. Freshman course, required for the degree of A.B., second term, 4 hours a week. Professors Prentice, Hutson, Fox, Johnson; Dr. Cary, Dr. Durham, Mr. Scoon, and Mr. Stringfellow.
103. Selections from the Historical Literature of Rome. Livy, Sallust, and Cicero. One hour a week will be devoted, with the two upper divisions, to the study of Roman History, with the lower, to Latin composition and drill in Latin grammar. Freshman course, re-

quired of all candidates for the degrees of A.B., Litt.B., and B.S., first term, 4 hours a week. Professors Westcott, David Magie, Jr., Basore, Van Deventer, Fox, and Johnson; Mr. Jones; Dr. Mierow, Dr. Cary, Dr. Durham, Mr. Scoon, Mr. Ruth, Dr. Harrer, and Mr. Stringfellow.

104. Selections from the Historical Literature of Rome. Tacitus, Pliny the Younger. One hour a week will be devoted, with the two upper divisions, to the study of Roman History, with the lower, to Latin composition and drill in Latin grammar. Freshman course, required of all candidates for the degrees of A.B., Litt.B., and B.S., second term, 4 hours a week. Professors Westcott, Stuart, David Magie, Jr., Basore, Harmon, Van Deventer, Fox, and Johnson; Mr. Jones; Dr. Mierow, Dr. Cary, Dr. Durham, Mr. Scoon, Mr. Ruth, Dr. Harrer, and Mr. Stringfellow.
201. Greek Drama: Aristophanes and Euripides. Selected plays. Lectures on the development of the drama, on the presentation of plays, on the authors and their works. Sophomore course, required of candidates for the degree of A.B., first term, 3 hours a week. Professors Robbins, Capps, Hutson, Van Deventer, and Fox.
202. The Odyssey. The entire Odyssey will be read, and its structure studied. Lectures and assigned readings in the history of the epic and the romance. Sophomore course, elective for candidates for the degree of A.B., second term, 3 hours a week. Professor Harmon. [This course will be given first in 1914-1915. The course in 1913-1914 will be Lucian.]
203. Roman Comedy. Reading of selected plays of Plautus and Terence. Sophomore course, elective for candidates for the degree of A.B., required alternative for candidates for the degrees of Litt.B. and B.S. (see

p. 43), first term, 3 hours a week. Professors Stuart, Basore, and Johnson; Dr. Cary and Dr. Mierow. [This course will be given first in 1914-1915. The course in 1913-1914 will be Tacitus and Pliny the Younger.]

204. Horace and Catullus. Horace: Odes and Satires; Catullus: Selections. Sophomore course, required for candidates for the degree of A.B., required alternative for candidates for the degrees of Litt.B. and B.S. (see p. 43), second term, 3 hours a week. Dean West, Professors Van Deventer and Fox; Dr. Mierow, Dr. Cary, Dr. Durham, Mr. Scoon, Mr. Ruth, Dr. Har-
rer, and Mr. Stringfellow.

JUNIOR AND SENIOR YEARS

Students not candidates for Honors in the Department of Classics are restricted to the following courses:

JUNIOR COURSES

First Term—Latin Literature 317, Cicero's Letter 307, Aeschylus and Sophocles 313, Homer 311.

Second Term—Latin Literature 318, Plautus 316, Greek Lyric Poets 310, Plato 312.

SENIOR COURSES

First Term—Lucretius 401, Roman Law 419, Aristophanes 415.

Second Term—Virgil 412, Classical Influences 416, Roman Law 420.

Candidates for Final Special Honors in the Department of Classics must choose their two departmental courses from the following list. Courses not designated as Honors courses may be taken as free electives by candidates for Honors in the department.

JUNIOR COURSES

First Term—Latin Literature 317, Roman History 305, Aeschylus and Sophocles 313, Homer 311.

Second Term—Latin Literature 318, Roman History 306, Greek Lyric Poets 310, Plato 312.

SENIOR COURSES

First Term—Lucretius 401, Cicero 405, Roman Law 419, Greek History 403, Thucydides 409.

Second Term—Virgil 412, Tacitus 414, Roman Law 420, Greek History 404, Aristotle 410, Classical Influences 416.

COURSES

317. Latin Literature of the Republic. Study of the development of the Latin language, the national character, the several literary forms, and Greek influence. Assigned reading chiefly from Ennius, Plautus, Terence, Cato, Lucilius, Lucretius, Varro, Cicero, Sallust, and Catullus. Junior course, first term, 3 hours a week. Professor Van Deventer.
318. Roman Literature of the Empire. One lecture, two recitations weekly. The lectures will give a general survey of the history of Roman literature from Augustus to Marcus Aurelius. The other hours will be devoted to the study of representative works of this period, the purpose, construction, and literary qualities of which will be discussed by the students. Junior course, second term, 3 hours a week. Professor David Magie, Jr.
305. Roman History. Roman History to the beginning of the Empire. The constitution of the primitive Roman state; the development of the social, political, and legal institutions of the Republic, the foreign conquests and civil wars. Special topics, as they are encountered, will be studied and results embodied in written reports. The preceptorial work will consist of reading in Latin or Greek historians. Junior course, first term, 3 hours a week. Professor Westcott. (May count, for those qualified for the Honors Course in Classics, as a course in History.)

306. Roman History. Roman History from the beginning of the Empire to the age of Justinian. The constitution of the empire, and its changes; the development of universal Roman law and cosmopolitan society; provincial administration; the rise of Christianity; the barbarian invasions and the beginnings of the nations of modern Europe. Junior course, second term, 3 hours a week. Professor Westcott. (May count, for those qualified for the Honors Course in Classics, as a course in History.)
307. Letters of Cicero. Attention will be given especially to Cicero's correspondence with his personal and literary friends for the light which it throws on his character, his tastes, his literary interests, and the condition of society in his day. Junior course, first term, 3 hours a week. Professor David Magie, Jr.
316. Plautus. At least six plays will be read. The class will also study Plautine versification, and the relationship of Plautus to the Greek New Comedy and to the modern drama. Junior course, second term, 3 hours a week. Professor Harmon.
313. Sophocles and Aeschylus. One lecture, two recitations weekly. Two plays will be translated and interpreted in detail, and their literary qualities, dramatic construction, and stage-setting studied. Other plays will be read in translations, and their plots and characters discussed. The lectures will deal with the production of a Greek play, with the myths involved and their development in literature and art, and with the tragic drama of the Greeks and its influence on modern literature. Junior course, first term, 3 hours a week. Professor Prentice.
310. Greek Lyric Poets. A survey of Greek poetic literature from the seventh century to the third century, with extensive reading in the elegiac, iambic and

- metric poets and in Theocritus. Junior course, second term, 3 hours a week. Professor Robbins.
311. Homer. Reading of large portions of the Iliad and Odyssey. Lectures on Greek epic poetry, and on the language and problems of the Homeric poems. Junior course, first term, 3 hours a week. Professor Robbins.
312. Plato. One or more short dialogues entire, with substantial portions of others: Protagoras, Phaedo, Phaedrus, Gorgias, Republic. Study of form, style, and philosophic content. Junior course, second term, 3 hours a week. Professor Hutson.
- *401. Lucretius. Reading of selected books of the *De Rerum Natura* with attention to the philosophical content and the literary characteristics of the poem. Individual work will be developed by theses, written discussions of problems in interpretation and criticism. Senior course, first term, 3 hours a week. Professor Basore.
412. Virgil. A study of the literary methods and poetic art of Virgil; reading and discussion of the Eclogues and of selected books of the Aeneid; illustrative lectures and occasional critical interpretations. Senior course, second term, 3 hours a week. Professor Stuart.
- *405. The Life and Works of Cicero. A study will be made of the order and circumstances of the composition of the writings of Cicero, and the significance of Cicero in literary and political history. Reports on representative works will be prepared by members of the class and submitted for general discussion. Senior course, first term, 3 hours a week. Professor David Magie, Jr.

* Also listed as graduate course.

- *414. Tacitus. Reading of the annals and histories of Tacitus, with special attention to the author's style as a writer and his aims and methods as an historian. Senior course, second term, 3 hours a week. Professor Westcott.
- *419, 420. Roman Law: The History and Institutes of Roman Law. Sohm: *Institutes of Roman Law*, English translation; Leage: *Roman Private Law*. Special attention will be given to the law of Obligations. Students in the Department of Classics, and others who desire to do so, will read the Institutes of Gaius and of Justinian in Latin. Senior course, both terms, 3 hours a week. Professor Westcott.
- *403, 404. Greek History. Lectures will be given on Greek History, from the earliest times to the Roman conquest, and on the methods, scope and results of historical criticism. Collateral reading will be assigned. Portions of the works of Greek historians will be read in the original, and their testimony analyzed and compared. Senior course, both terms, 3 hours a week. Professor Prentice. (May count, for those qualified for the Honors course in Classical Humanities, as a course in History.)
- *409. Thucydides. Selections from his account of the Peloponnesian War will be edited by the members of the class, with textual, grammatical and exegetical commentaries. Lectures will be given by the instructor, and reports will be presented by members of the class, dealing with Greek historical literature in general, and with the life of Thucydides, his sources and methods, the literary and historical value of his work, and his influence in ancient and modern times. Senior course, first term, 3 hours a week. Professor Prentice.
- *410. Aristotle. Reading and discussion of selections from Books i, ii, iii, v, and x of the Nicomachean Ethics,

* Also listed as graduate course.

together with lectures on the relation of the ethical theories of Aristotle to other leading theories of his time. Reading and discussion of selections from the first five books of the *Politics*, special attention being given to Aristotle's criticism of actually existing constitutions and to his positive constitutional theory. Senior course, second term, 3 hours a week. Professor Fox.

415. Aristophanes. Several plays of Aristophanes will be read, with introductory exercises in Greek metres. Lectures on Greek Comedy and on Aristophanes. Senior course, first term, 3 hours a week.
416. Classical Influence in English Literature. The quality of English Literature as variously determined by the influence of the classics; the spirit of the classics as manifest in the form and the content of English Literature. Readings in such authors as Aeschylus, Plato, Theocritus, Bion, Moschus, Virgil, Horace; Spenser, Milton, Pope, Shelley, Tennyson. Senior course, second term, 3 hours a week. Lecturer, Professor Osgood; Preceptor, Professor David Magie, Jr.

For regulations regarding Final Special Honors in Classics, see page 121.

For graduate courses in Classics, see the University Catalogue, pages 247 to 256.

VI. DEPARTMENT OF ENGLISH

PROFESSORS HUNT, HENRY VAN DYKE, HARPER, PARROTT, AXSON, COVINGTON, SPAETH, OSGOOD, GEROULD, GRIFFIN, LONG, MAC DONALD, ROOT, CROLL, MILES, KENNEDY, HEERMANCE, AND MURCH; MR. VAN WINKLE

- 101, 102, *a*. Selected English authors, for special study and for general reading. The principles of composi-

tion and rhetoric will be derived therefrom. Frequent reports on assigned reading. Freshman required course, both terms, 2 hours a week for A.B., Litt.B., B.S., and C.E. freshmen. Professor Covington. Preceptors, Professors Croll, Heermance, MacDonald, Miles, Root.

- 101, 102, *b*. To freshmen who enter the Cliosophic or the American Whig Society there is offered, as a substitute for 101, 102, *a*, an elective course in Public Speaking and Debate. Freshman course, both terms, 2 hours a week for A.B., Litt.B., B.S., and C.E. freshmen. Professor Covington, assisted by Mr. van Winkle in the American Whig Society and Professor Heermance in the Cliosophic Society.
- 201, 202. Outline Sketch of English Literature. A survey of English literature from earliest times to the Victorian Age. Occasional lectures; oral and written recitations; reports on required reading. The reading in this course is designed to illustrate the various periods in the history of English literature. Sophomore elective, both terms, 3 hours a week. Lecturers, Professors Parrott and Spaeth; Preceptors, Professors Gerould, Griffin, Kennedy, Long.
301. English Literature: The Sixteenth Century. The revival of learning, the Reformation, the national awakening under the Tudors, and the influence of Italy, in their effect upon English letters. Spenser, Sidney, and Marlowe will be studied. Attention will be paid to the history of the drama and of lyric poetry, and to the narrative of Elizabethan voyagers. Junior course, first term, 3 hours a week. Lecturer, Professor Harper; Preceptors, Professors Croll, Heermance, MacDonald, Miles, Murch, Root.
302. English Literature: Shakespeare. A study of some of Shakespeare's representative plays. Reference

- books: Dowden: *Shakespeare, His Mind and Art*; Boas: *Shakespeare and His Predecessors*. Junior course, second term, 3 hours a week. Lecturer, Professor Harper; Preceptors, Professors Croll, Heermance, MacDonald, Miles, Murch, Root.
303. History of the English Language. Lectures on the history, vocabulary, and structure of the English Language. Emerson: *English Language*; Whitney: *Life and Growth of Language*; Skeat: *Piers, the Plowman*. Junior course, first term, 3 hours a week. Lecturer, Professor Hunt; Preceptors, Professors Croll, MacDonald, Miles, Murch, Root.
304. Elementary Old English. A grammatical and phonological study of Old English, with readings mainly from Old English prose literature. Smith: *Old English Grammar*; Bright: *Anglo-Saxon Reader*. Junior course, second term, 3 hours a week. Prerequisite to English 405. Lecturer, Professor Hunt; Preceptors; Professors Croll, Miles, Murch, Root.
- *401. Restoration and Eighteenth Century Literature. Discussion of leading poets and prose writers from Dryden to Burns, with especial emphasis on the rise of the Romantic School. Senior course, first term, 3 hours a week. Lecturer, Professor Osgood; Preceptors, Professors Gerould, Griffin, Kennedy, Long.
402. Seventeenth Century Literature. Lectures on the poets and prose writers during the age of Milton. The assigned reading will include the larger part of Milton's poetry, his *Areopagitica*, his *Letter on Education*, Browne's *Religio Medici*, Walton's *Compleat Angler*, and selections from the Cavalier poets. Senior course, second term, 3 hours a week. Lecturer, Professor Harper; Preceptors, Professors Gerould, Griffin, Kennedy, Long.

* Also listed as graduate course.

- *403. English Prose of the Nineteenth Century. A literary study of the chief prose-writers of the Romantic and Victorian eras. Senior course, first term, 3 hours a week. Lecturer, Professor Axson; Preceptors, Professors Gerould, Griffin, Kennedy, Long.
- *404. English Poetry of the Nineteenth Century. A study of some of the leading British and American poets of the period. Senior course, second term, 3 hours a week. Lecturer, Professor Spaeth; Preceptors, Professors Gerould, Griffin, Kennedy, Long.

Note. The order of courses 403 and 404 is reversed in successive years, and the professors in charge alternate.

- *405. Advanced Old English. Selections, mainly poetical, from Old English Literature will be read, under direction of the professor in charge and the preceptors, two hours a week. One hour a week will be devoted to lectures by the professor in charge on historical and critical topics. Bright's *Anglo-Saxon Reader* and Wyatt's *Beowulf* will be the basis for selections. A thesis will be required. Senior course, first term, 3 hours a week. Prerequisite course: English 304. Lecturer, Professor Hunt; Preceptors, Professors Gerould, Griffin, Kennedy, Long.
406. Chaucer and his Contemporaries. Lectures on Chaucer, his period, his language, and his contemporaries. The reading will include the greater part of Chaucer's poetry, together with selections from Langland, Gower, Wyclif, and the author of *Sir Gawaine and the Green Knight*. A thesis of considerable length, embodying the results of independent investigation, conducted under the guidance of the preceptors, will be required of every student. One hour a week will

* Also listed as graduate course.

be devoted to lectures and two hours a week to preceptorial conferences. Skeat: *Student's Chaucer*; Skeat: *Piers, the Plowman*. A handbook dealing with the period will also be used. Senior course, second term, 3 hours a week. Lecturer, Professor Parrott; Preceptors, Professors Gerould, Griffin, Kennedy, Long.

Classics 416 may be elected as a course in English by those qualified for the Honors Course in the Classical Humanities (page 78).

For regulations regarding Final Special Honors in English, see page 125.

For graduate courses in English see the University Catalogue, pages 256 to 260.

VII. DEPARTMENT OF MODERN LANGUAGES

PROFESSORS VREELAND, GAUSS, BUFFUM, COLLINS, HOSKINS, BLAU, PRIEST, CRITCHLOW, KOREN, THAYER, MICHAUD, MATHEWS, STUART, AND BENDER; DR. BRAUN, MR. MOSELEY, MR. REDFIELD, MR. CAMPION, MR. CHAPMAN, AND DR. WALLACE

GERMANIC SECTION

- 101, 102. Beginners' German. Grammar, reading, and composition. Freshman course, both terms, 3 hours a week, Professor Hoskins, Dr. Wallace, and Mr. Campion.
- 103, 104. German Prose and Poetry. Reading of selected works with drill in grammar and exercises in composition. Freshman course, both terms, 2 hours a week for A.B. freshmen; 3 hours a week for Litt.B. and B.S. freshmen. Prerequisite course: Entrance German A. Prerequisite to Sophomore German. Pro-

fessor Bender; Dr. Braun, Dr. Wallace, and Mr. Campion.

- 105, 106. Advanced German for freshmen. Reading of historical, descriptive, and narrative prose, with exercises in composition. Texts are selected to form a general introduction to the study of modern German life and letters. Open to freshmen who have entered on German B. Both terms, 3 hours a week. Either German 105, 106 or 203, 204 is prerequisite to the German courses of junior and senior years. Professor Bender and Dr. Braun.
- 201, 202. Beginners' German. Grammar, reading, and composition. Sophomore elective course, both terms, 3 hours a week. Professor Hoskins, Dr. Wallace, and Mr. Campion.
- 203, 204. Sophomore German. An introduction to German literature of the eighteenth and nineteenth centuries. Reading of selected works; collateral reading. Sophomore elective course, both terms, 3 hours a week. Prerequisite course: German 103, 104, or entrance German B. Either German 203, 204, or 105, 106 is prerequisite to the German courses of junior and senior years. Professor Thayer and Dr. Wallace; Preceptors, Professor Thayer, Dr. Wallace, and Mr. Campion.
- 301, 302. German Literature from Opitz to Schiller. First term: selected works of Wieland and Lessing will be read and interpreted in the class; collateral reading in both German and English; lectures on German literature from Opitz to Lessing's death. Second term: selected works of Schiller; collateral reading in both German and English; lectures on German literature from Lessing's death to Schiller's death. Reference books: Scherer's Robertson's and Francke's

histories of German literature. Junior course, both terms, 3 hours a week. Prerequisite course: German 105, 106 or 203, 204. Professor Hoskins.

- 303, 304. Goethe's Life and Works. Lectures and reading. Götz von Berlichingen, Werthers Leiden, Iphigenie, Tasso, Hermann und Dorothea, Faust, Gedichte, Dichtung und Wahrheit, with collateral reading. Reference books: English and German works on Goethe's life and on Faust. Junior course, both terms, 3 hours a week. Prerequisite course: German 105, 106 or 203, 204. Professor Blau.
- 401, 402. The Romantic School in Germany and German Literature since Goethe's death. This course comprises the reading of selected works, lectures, and collateral reading. Senior course, both terms, 3 hours a week. Prerequisite course: German 105, 106 or 203, 204. Professor Thayer.
- 403, 404. Middle High German. Elements of Middle High German grammar. Readings in mediaeval German epic poetry in the first term, and in the epic and lyric poetry of the same period in the second term. Senior course, both terms, 3 hours a week. Prerequisite course: German 105, 106 or 203, 204. Professor Hoskins.

ROMANIC SECTION

- 101, 102. Beginners' French. Grammar, composition, and reading. Aldrich and Foster: *Grammar*. Freshman course, both terms, 3 hours a week. Professor Mathews, Mr. Moseley, and Mr. Chapman.
- 103, 104. Freshman French. This course consists of reading and practical exercises in French syntax and composition, and collateral reading. Freshman course, both terms, 2 hours a week for A.B. freshmen, 3

- hours a week for Litt.B. and B.S. freshmen. Prerequisite course: Entrance French A. Prerequisite to Sophomore French. Professors Buffum, Critchlow, and Mathews; Mr. Moseley and Mr. Chapman.
- 201, 202. Beginners' French. Grammar, composition, and reading. Aldrich and Foster: *Grammar*. Sophomore elective, both terms, 3 hours a week. Professor Mathews, Mr. Moseley, and Mr. Chapman.
- 203, 204. Sophomore French. General introduction to the study of French literature. This course consists of a general survey of French literature, based on textbooks, with a study of representative works of different periods. Sophomore elective, both terms, 3 hours a week. Prerequisite course: French 103, 104, or Entrance French B. Prerequisite to French 301, 302; 401, 402, 403, 404, 405, 406. Professors Stuart, Collins, Critchlow, Mathews, Michaud; Preceptors, Professors Stuart, Collins, Critchlow, Mathews, Michaud, Gauss, Koren, and Mr. Chapman.
- 301, 302. French. The French literature of the seventeenth century. Special attention is given to the development of the drama and to the general characteristics of the age of Louis XIV. Junior course, both terms, 3 hours a week. Prerequisite course: French 203, 204. Professors Koren and Collins.
305. Italian. Grammar, composition, and reading. Grandgent: *Italian Grammar*. Junior course, first term, 3 hours a week. Prerequisite to Italian 306. Professor Koren.
306. Italian. Reading of the *Inferno* of Dante. Scartazzini: *La Divina Commedia di Dante Alighieri*. Junior course, second term, 3 hours a week. Prerequisite course: Italian 305. Prerequisite to Italian 405. Professor Gauss.
- 307, 308. Spanish. Grammar, composition, and reading

- from modern Spanish authors. Junior course, both terms, 3 hours a week. Prerequisite to Spanish 407, 408. Mr. Redfield and Professor Critchlow.
- 401, 402. French. The Romantic Movement. A literary study of the leading French poets and prose writers from Rousseau to Anatole France. Senior course, both terms, 3 hours a week. Prerequisite course: French 203, 204. Professor Gauss.
- 403, 404. Old French. A study of the language and literature of France from its origin to the Renaissance. This course consists of a general survey of the history of the language, and of the extensive reading of texts with special attention to their literary side. Senior course, both terms, 3 hours a week. Prerequisite course: French 203, 204. Professor Buffum.
405. French Literature of the Eighteenth Century. This course includes a general survey of French literature from 1715 to the end of the eighteenth century, with a special study of Voltaire's relations to his times, the *Encyclopédie*, Diderot, J. J. Rousseau, and the new literature after him. Senior course, first term, 3 hours a week. Prerequisite course: French 203, 204. Professor Michaud.
406. French Literature of the Sixteenth Century. This course is based on an extensive reading of selections from the sixteenth century French prose and poetry, with special attention given to Montaigne, Rabelais, and the *Pléiade*. It includes also a study of the Renaissance in France, and of the beginnings of Classicism. Senior course, second term, 3 hours a week. Prerequisite course: French 203, 204. Professor Michaud.
407. Italian. Reading and literary study of the poets of the earlier period and the prose writers of the Renaissance. Senior course, first term, 3 hours a week.

- Prerequisite course: Italian 306. Prerequisite to Italian 408. Professor Gauss.
408. Italian. Reading and literary study of the poets of the Renaissance and modern Italian authors. Senior course, second term, 3 hours a week. Prerequisite course: Italian 407. Professor Koren.
409. Spanish. General survey of Spanish literature and extensive readings from modern Spanish authors. Senior course, first term, 3 hours a week. Prerequisite courses: Spanish 307, 308. Prerequisite to Spanish 410. Mr. Redfield.
410. Spanish. Spanish literature of the Golden Age and readings from Cervantes, Calderón, and Lope de Vega. Senior course, second term, 3 hours a week. Prerequisite courses: Spanish 307, 308, 409. Mr. Redfield.
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For regulations regarding Final Special Honors in Modern Languages, see page 124.

For graduate courses in Modern Language, see the University Catalogue, pages 261 to 267.

COURSES NOT INCLUDED IN ANY OF THE PRECEDING DEPARTMENTS

- *401, 402. Sanskrit. Senior course, both terms, 3 hours a week. Professor Robbins.
- 403, 404. Biblical Literature. Old Testament Literature. Origin, development, nature and content of the literature of the Old Testament. First term: General introductory lectures upon religion and the Bible, followed by a study of the pre-Exilic Old Testament literature. Required reading: Several pre-Exilic Old Testament writings: Dods: *The Bible, Its Nature and Origin*; Addis: *The Hebrew Religion*; Kent: *History of the Hebrew People (United Kingdom and Divided Kingdom)*. Second term: The Exilic and post-Exilic Old Testament literature. Required reading: Several Exilic and post-Exilic Old Testament writings: Sabatier: *Philosophy of Religion*; Cornill: *The Prophets of Israel*; Kent: *History of the Hebrew People (Babylonian, Persian and Greek Periods)*. This course, while dealing primarily with the literature of the Old Testament, includes a thorough discussion, in preceptorial hours, of the nature and significance of Christianity. Lectures and preceptorial work. Senior course, both terms, 3 hours a week. Professor Miller.
- 405, 406. Biblical Literature. New Testament Literature. Origin, development, nature and content of the literature of the New Testament. First term: General introductory lectures upon religion and the Bible, followed by a study of the four Gospels, the life of Christ, and the nature of Christianity. Required reading: the Gospels; Dods: *The Bible, Its Nature and Origin*; Mathews: *New Testament Times*; Rhees:

* Also listed as graduate course.

Life of Jesus of Nazareth; Percy Gardner: *An Historical View of the New Testament*. Second term: Introductory lectures and study of the Pauline and post-Pauline New Testament literature. Required reading: the remaining New Testament books; Sabatier: *Philosophy of Religion*; Ropes: *Apostolic Age*; Sabatier: *The Apostle Paul*. Lectures and preceptorial work. Senior course, both terms, 3 hours a week. Professor Miller.

- *408. History of Modern Science. This is a non-technical course in the development of scientific thought from the time of Copernicus and Galileo to the present. The course runs parallel to the courses in the history of philosophy and of literature and of political and social thought. The character and the influence of the great discoveries in Astronomy, Mechanics, Physics, Chemistry and Biology will be studied by means of lectures and reading. The general purpose of the course is to give both the technical and the non-technical student information and training in the meaning and historical results of scientific investigation in different fields. The course continues the History of Greek Philosophy 407. Senior course, second term, 3 hours a week. Professor Spaulding.

* Also listed as graduate course.

C. DIVISION OF MATHEMATICS AND SCIENCE

VIII. DEPARTMENT OF MATHEMATICS

DEAN FINE, PROFESSORS THOMPSON, EISENHART, VEBLEN,
 GILLESPIE, BOUTROUX, HUN, MAC INNES, SWIFT, AND
 WEDDERBURN; DR. DEDERICK, MR. GILMAN,
 AND DR. GRONWALL

101. Plane Trigonometry. Hun and MacInnes. *Elements of Plane and Spherical Trigonometry*. Required of all freshmen who have not taken the subject for entrance. Half of first term, 4 hours a week. Professors Fine, Gillespie, and Swift; Mr. Gilman, and Dr. Gronwall.
103. Selected portions of Algebra: Undetermined Coefficients, Division Transformation, Partial Fractions, Elementary Theory of Equations, Permutations and Combinations; Review of Plane Trigonometry; Elements of Spherical Trigonometry. Fine: *College Algebra*; Hun and MacInnes: *Elements of Plane and Spherical Trigonometry*. Required of all C.E. freshmen. All of first term, 4 hours a week. Professors Swift and MacInnes.
105. Selected portions of Algebra. Division Transformation, Permutations and Combinations, Determinants, and Elementary Theory of Equations. Fine: *College Algebra*. Required of all freshmen who have not taken Plane Trigonometry for entrance. Half of first term, 4 hours a week. Professors Fine, Gillespie and Swift; Mr. Gilman, and Dr. Gronwall.
107. Selected portions of Algebra. Undetermined Coefficients, Division Transformation, Partial Fractions, Elementary Theory of Equations, Permutations and Combinations, and Determinants; Review of Plane Trigonometry. Fine: *College Algebra*; Hun and Mac-

Innes: *Elements of Plane and Spherical Trigonometry*. Required of all A.B., Litt.B., and B.S. freshmen who have taken Plane Trigonometry for entrance. All of first term, 4 hours a week. Professors Hun, MacInnes, and Wedderburn; Dr. Dederick.

108. Coördinate Geometry, treated from the Cartesian standpoint. Fine and Thompson: *Coördinate Geometry*. Required of all freshmen. All of second term, 4 hours a week. Professors Fine, Thompson, Gillespie, Hun, MacInnes, Swift, and Wedderburn; Dr. Dederick, Mr. Gilman, and Dr. Gronwall.
- 201, 202. Calculus. Elective course, open to all sophomores who are candidates for a bachelor's degree, both terms, 3 hours a week. Prerequisite to the Departments of Mathematics and Physics. Professors Gillespie, MacInnes and Swift; Dr. Dederick.
- 203, 204. Calculus. (See Department of Civil Engineering.)
205. Geometry, a course supplementary to course 108. Required of all C.E. sophomores, first term, 2 hours a week. Professor Thompson.
206. Analytical Mechanics. Introductory course. Required of all C.E. sophomores, second term, 2 hours a week. Professor Hun.
301. Analytic Solid Geometry. Junior course, first term, 3 hours a week. Professor Thompson.
302. Elementary Differential Equations. Junior course, second term, 3 hours a week. Professor MacInnes.
- 303, 304. (Physics 303, 304.) Analytical Mechanics. The general principles of mechanics; the statics and dynamics of particles and rigid bodies. Lectures. Junior course, both terms, 3 hours a week. Prerequisite courses: Mathematics 201, 202. Professor Gillespie.
- 305, 306. Analytical Mechanics. Required of all C.E.

juniors, both terms, 3 hours a week. Professors Gillespie and MacInnes.

- 401, 402. Advanced Calculus and Higher Algebra. Elementary course introductory to the notions and methods of modern mathematical analysis. Lectures. Senior course, both terms, 3 hours a week. Prerequisite to the graduate courses in mathematics and astronomy. Professor Eisenhart.
- 403, 404. (Physics 403, 404.) Theoretical Physics. A course in the mathematical theory of electricity and magnetism. Starling: *Magnetism and Electricity*. Lectures. Senior course, both terms, 3 hours a week. Prerequisite courses: Mathematics 201, 202. Professor Cooke.

HONORS COURSES IN MATHEMATICS*

The Department of Mathematics offers, in conjunction with the Department of Physics, the following courses, which are open to candidates for honors in mathematics and physics:

- 205, 206. Honors course in Calculus: Differential and Integral Calculus. Differentiation of algebraic and elementary transcendental functions. Integration. Applications of differentiation including maxima and minima. Partial differentiation. Definite integrals. Geometrical and physical applications. Special curves. Curvature. Envelopes. Infinite series and Taylor's theorem. Sophomore course, both terms, 4 hours a week. Prerequisite to the honors courses of junior year. Professor Fine.
- 305, 306. A. Geometry. Coördinate Geometry. The general equation of the second degree. Diameters and polars. Metric properties of conics. Coördinate sys-

* For Honors Courses in Celestial Mathematics, see p. 112.

tems in space. Transformation of coördinates. The general equation of the second degree and the classification of quadrics. Centers, conjugate diameters, and plane sections of quadrics. Generating lines. General properties of twisted curves and surfaces. Junior course, both terms, 3 hours a week. Professor Thompson.

307, 308, B. Analysis. Differential Equations and Advanced Calculus. Solution of ordinary equations of first and higher orders, of systems of ordinary equations and linear partial equations, of partial equations of the first order in one dependent and two independent variables. The line-element and singular solutions. Method of multipliers. Variation of parameters. Bessel's equation. Riccati's equation. Application to geometry, mechanics and the calculus of variations. General properties of continuous functions. Graphical study of uniform convergence. Integration of series. Integrals containing a parameter. Fourier series and some simple applications. Junior course, both terms, 3 hours a week. Professor Boutroux.

309, 310, C. Applied Mechanics. Mechanics. Kinematics. Laws of Motion. Statics of particles and rigid bodies. Center of gravity. Work and energy. Stability and instability. Motion of particles under constant and variable forces. Orbits. Motion of rigid bodies. Generalized coördinates and Lagrange's equations. Small oscillations. Junior course, both terms, 3 hours a week. Professor Eisenhart.

*407, 408, A. Geometry or Algebra.

Projective Geometry. The postulates of synthetic projective geometry. The relation of analytic to

* Also listed as graduate course.

synthetic geometry. The principle of duality. Projectivity of one-dimensional forms. Elementary configurations. Conic sections and quadric surfaces. Linear congruences and complexes. Collineations in the plane and in space. Real and imaginary elements in geometry. Senior course, both terms, 3 hours a week. Professor Eisenhart. [1913-1914.]

Algebra. Theory of equations. Determinants. Linear dependence. Linear transformations. Matrices. Quadratic and bilinear forms. Elementary divisors. Factorization of polynomials. Senior course, both terms, 3 hours a week. Professor Veblen. [1914-1915.]

The courses in Projective Geometry and Algebra are given in alternate years.

*409, 410 b. Analysis. Continuation of B. Transformation of differentials. Line and surface integrals. Green's theorem. Improper definite integrals. Beta and Gamma functions. Elliptic integrals. Evaluation of special definite integrals, and applications to various problems. Mean value and probability. Elementary functions of the complex variable. Roots of unity. Conformal maps. Cauchy's theorem. Definite integrals. Poles and residues. Senior course, both terms, 3 hours a week. Professor Wedderburn.

*411, 412. c. (Physics 411, 412, c.) Applied Mathematics. Electricity and Magnetism. Theory of the potential and of lines and tubes of force. The principles of electrostatics. The electrostatic field. System of charged conductors. Dielectrics. Special problems of electrostatics. Currents of electricity in linear conductors. The flow of electricity in solid conductors and in dielectrics. The principles of magnetism. Induced

* Also listed as graduate course.

magnetism. Terrestrial magnetism. The magnetic field produced by electric currents. Induction in linear circuits. The general equations of the electro-magnetic field. Electromagnetic waves and the electro-magnetic theory of light. The motion of electrons. Senior course, both terms, 3 hours a week. Professor Adams.

For regulations regarding Final Special Honors in Mathematics and Physics, see page 127.

For graduate courses in Mathematics, see the University Catalogue, pages 268 to 270.

IX. DEPARTMENT OF PHYSICS

DEAN MAGIE, PROFESSOR LOOMIS, DEAN MCCLENAHAN, PROFESSORS RICHARDSON, TROWBRIDGE, ADAMS, ROBINSON, COOKE, AND NORTHRUP; MR. STEVENS, MR. K. K.

SMITH, MR. CARSON, MR. ROGERS, MR.

SHERWOOD, MR. KIEFFER, AND

MR. WATERMAN

101, 102. General Physics. General course in physics, including lectures, recitation, and laboratory work. Reed and Guthe: *College Physics*. Freshman course, for all C.E. freshmen, and for Litt.B. and B.S. freshmen who do not take the alternative course in General Chemistry (Chemistry 103, 104). Both terms, 4 hours a week. For this course a fee of \$5 is charged and a deposit on apparatus of \$5 is required. Professors McClenahan, Trowbridge, Cooke, and Northrup; Mr. Stevens, Mr. K. K. Smith, Mr. Carson, Mr. Rogers, Mr. Sherwood, Mr. Kieffer, and Mr. Waterman.

201, 202. General Physics. General course in physics,

including lectures, recitation, and laboratory work. Reed and Guthe: *College Physics*. Sophomore course, for A.B. sophomores who do not take the alternative course in General Chemistry (Chemistry 201, 202) and for Litt.B. and B.S. sophomores who take General Physics. Both terms, 4 hours a week. For this course a fee of \$5 is charged, and a deposit on apparatus of \$5 is required. Professors Trowbridge, McClenahan, Cooke, and Northrup; Mr. Stevens, Mr. K. K. Smith, Mr. Carson, Mr. Rogers, Mr. Sherwood, Mr. Kieffer, and Mr. Waterman.

203, 204. Heat, Electricity and Magnetism. Lectures based on experimental demonstrations. Frequent written recitations. Edser: *Heat*; Hadley: *Magnetism and Electricity*. Sophomore course, elective for Litt.B. and B.S. sophomores who have taken General Physics in freshman year. Both terms, 3 hours a week. Professor Loomis.

205, 206. Heat, and Electricity and Magnetism. Lectures based on experimental demonstrations. Frequent written recitations. Edser: *Heat*; Hadley: *Magnetism and Electricity*. Sophomore course, required of C.E. sophomores. Both terms, 3 hours a week. Professor Loomis.

301, 302. Experimental Physics. A course in experimental physics, with lectures and laboratory work. Miller: *Laboratory Physics*. Reference books: Stewart and Gee; Millikan. Junior course, both terms, 3 hours a week. Professors Loomis and Robinson.

303, 304. (Mathematics 303, 304.) Analytical Mechanics. The general principles of mechanics; the statics and dynamics of particles, rigid bodies, and fluids. Lectures. Junior course, both terms, 3 hours a week. Prerequisite course, Mathematics 201, 202. Professor Gillespie.

- 401, 402. Theoretical Physics. A course in the elementary mathematical theories of light and heat. Edser: *Light*; Poynting and Thomson: *Heat*. Lectures. Senior course, both terms, 3 hours a week. Prerequisite course: Mathematics 201, 202. Professors Robinson and W. F. Magie.
- 403, 404. (Mathematics 403, 404.) Theoretical Physics. A course in the mathematical theory of electricity and magnetism. Starling: *Magnetism and Electricity*. Lectures. Senior course, both terms, 3 hours a week. Prerequisite course: Mathematics 201, 202. Professor Cooke.

HONORS COURSES IN PHYSICS*

The Department of Physics offers, in conjunction with the Department of Mathematics, the following courses, which are open to candidates for honors in mathematics and physics:

- 207, 208. Preliminary course in General Physics. Mechanics, including kinematics, statics, and dynamics. Hydrostatics. Properties of matter. Sound. Heat. Geometrical optics. Sophomore course, both terms, 3 hours a week. Those taking this course do not take Physics 201, 202. Professor W. F. Magie.
- 309, 310, C. (Mathematics 309, 310, C.) Honors course in Analytical Mechanics. Mechanics. Kinematics. Laws of motion. Statics of particles and rigid bodies. Center of gravity. Work and energy. Stability and instability. Motion of particles under constant and variable forces. Orbits. Motion of rigid bodies. Generalized coördinates and Lagrange's equations. Small oscillations. Junior course, both terms, 3 hours a week. Professor Eisenhart.
- 311, 312, D. Honors course in General Physics.

* For Honors Courses in Celestial Mathematics, see p. 112

a. Electricity and Magnetism. The electric current. Resistance. Electromotive force. Electrolysis. Batteries. The principles of electrical measurements. The electric field. Electrostatic instruments. The phenomena of discharge. Magnetism. The systems of electric and magnetic units.

b. Physical Optics. Elementary discussion of the undulatory theory. Interference, Young's and Fresnel's experiments. Diffraction. Applications to the theory of optical instruments. Double refraction and polarization. Simple cases of effect of crystal plates. Rotary polarization. Dispersion and absorption. Spectrum analysis. Junior course, both terms, 3 hours a week. Professor Trowbridge. (For the year 1913-1914 this course will be given by Professor Robinson.)

313, 314, E. Experimental Physics. Experiments in mechanics, properties of matter, sound, heat, and light. Junior course, both terms, 3 hours a week. Professors Loomis and Robinson.

*411, 412, c. (Mathematics 411, 412, c.) Theory of Electricity and Magnetism. Theory of the potential and of lines and tubes of force. The principles of electrostatics. The electrostatic field. System of charged conductors. Dielectrics. Special problems of electrostatics. Currents of electricity in linear conductors. The flow of electricity in solid conductors and in dielectrics. The principles of magnetism. Induced magnetism. Terrestrial magnetism. The magnetic field produced by electric currents. Induction in linear circuits. The general equations of the electromagnetic field. Electromagnetic waves and the electromagnetic theory of light. The motion of electrons. Senior course, both terms, 3 hours a week. Professor Adams.

* Also listed as graduate course.

*413, 414, d. Theoretical Physics.

a. Thermodynamics. The classical theories of Clausius and Lord Kelvin. Gibbs' theory of thermodynamic equilibrium. Applications to homogeneous bodies, to the ideal gas, and to solutions.

b. Electrical Properties of Gases. The kinetic theory of gases. Conduction of electricity through gases. Properties of the ions. Thermionics. The Roentgen rays. Radioactivity. Ionization by collisions and spark discharge. Senior course, both terms, 3 hours a week. Professors W. F. Magie and Richardson.

*415, 416, e. Experimental Physics. Experiments in electricity and magnetism. Lectures on electrical measurements. Special problems involving exercise in the experimental methods used in research. Senior course, both terms, 3 hours a week. Professor Cooke.

For regulations regarding Final Special Honors in Mathematics and Physics, see page 127.

For graduate courses in Physics, see the University Catalogue, pages 271 to 273.

X. DEPARTMENT OF CHEMISTRY

PROFESSORS MC CAY, NEHER, HULETT, FOSTER, SMITH, AND VAN NEST; MR. EASTMAN, MR. FLEECE, MR. CAPPS, MR. GOSS, MR. JENNINGS, MR. PARKER, MR. SWANSON, MR. FURMAN, MR. GORDON, MR. LA BARRON, MR. MARION, MR. MARTIN, MR. RICHARDSON, AND MR. SIBLEY

101, 102. General Inorganic Chemistry. Experimental lectures on the elements and their compounds, supplemented by laboratory work. Two lectures, one recita-

* Also listed as graduate course.

- tion, and one laboratory exercise of 3 hours each week. Smith: *General Chemistry for Colleges*. Required for C.E. freshmen, both terms, 4 hours a week. Professor Van Nest, assisted by Mr. Jennings.
- 103, 104. General Inorganic Chemistry. Experimental lectures on the elements and their compounds, supplemented by laboratory work. Two lectures, one recitation, and one laboratory exercise of 3 hours each week. The laboratory work is in part introductory to qualitative analysis. Smith: *General Chemistry for Colleges*. Freshman course, elective for Litt.B. and B.S., alternative to Physics 101, 102. Both terms, 4 hours a week. Prerequisite to all later courses in chemistry and mineralogy and to the Departments of Chemistry, Biology, and Geology. Professor Foster, assisted by Mr. Eastman, Mr. Fleece, Mr. Capps, Mr. Furman, Mr. Gordon, Mr. Goss, Mr. Jennings, Mr. La Barron, Mr. Marion, Mr. Martin, Mr. Parker, Mr. Richardson, Mr. Sibley, and Mr. Swanson.
- 201, 202. General Inorganic Chemistry. Experimental lectures on the elements and their compounds, supplemented by laboratory work. Two lectures, one recitation, and one laboratory exercise of 3 hours each week. The laboratory work is in part introductory to qualitative analysis. Smith: *General Chemistry for Colleges*. Sophomore elective, both terms, 4 hours a week. Prerequisite to all later courses in chemistry and mineralogy and to the Departments of Chemistry, Biology, and Geology. Professor Foster, assisted by Mr. Eastman, Mr. Fleece, Mr. Capps, Mr. Furman, Mr. Gordon, Mr. Goss, Mr. Jennings, Mr. La Barron, Mr. Marion, Mr. Martin, Mr. Parker, Mr. Richardson, Mr. Sibley, and Mr. Swanson.
- 301, 302. Chemistry of the Metals and Qualitative Analysis. The chemistry of the more important metals,

accompanied by the preparation of a number of inorganic compounds, and the study and practice of the methods for separating and detecting the more common bases and acids and their derivatives, followed by the analysis of simple and complex substances. The course involves 6 to 8 hours of laboratory work, besides class-room exercises, each week. Junior course, both terms, 3 hours a week. This course may also be taken as a sophomore elective for Litt.B. and B.S. students, who have taken Chemistry 103, 104. Prerequisite course: General Chemistry. Required in the Department of Chemistry. Professor Smith, assisted by Mr. Eastman and Mr. Sibley.

303. Qualitative Analysis. Lectures, recitations, and laboratory work. Junior course, first term, 4 hours a week. Required in the Department of Biology and *not open to students of other departments*. Chemistry 103, 104 or 201, 202 is prerequisite to this course. The course may be taken also by B.S. sophomores who have had Chemistry 103, 104 and who intend entering the Department of Biology, but only on recommendation of that department. Professor Van Nest, assisted by Mr. Jennings.
304. Organic Chemistry. Brief general course. Lectures, recitations, and laboratory work. Moore: *Outlines of Organic Chemistry*. Junior course, second term, 4 hours a week. Required in the Department of Biology and *not open to students in other departments*. This course may be taken by B.S. sophomores who have taken Chemistry 103, 104 and intend to enter the Department of Biology, but only on recommendation by the Department of Biology. Professor Neher, assisted by Mr. Goss.
305. Organic Chemistry, Part I. Introductory course devoted mainly to the study of the properties and rela-

tionships of the simpler alcohols and acids and their immediate derivatives. Lectures, recitations, and laboratory work. Perkin and Kipping: *Organic Chemistry*. Junior and senior course, first term, 3 hours a week. Required in the Department of Chemistry. Professor Neher, assisted by Mr. Goss.

For Honors: Special reading, conferences, and laboratory work.

306. Organic Chemistry, Part II. Continuation of Part I, including the more important of the higher homologues of the compounds studied there, compounds of multiple and mixed function, especially the dibasic, hydroxy-, amino-, and ketonic acids, and the carbohydrates. Lectures, recitations, and laboratory work. Perkin and Kipping: *Organic Chemistry*. Junior and senior course, second term, 3 hours a week. Required in the Department of Chemistry. Professor Neher, assisted by Mr. Goss.

For Honors: Special reading, conferences, and laboratory work.

307. Quantitative Analysis, Part I. The theory and practice of typical gravimetric and volumetric analyses, chiefly the analyses of simple salts. This course involves about nine hours of laboratory work, in addition to one or more class exercises, each week. Junior and senior course, first term, 3 hours a week. Prerequisite courses: General Inorganic Chemistry and Qualitative Analysis. Prerequisite to the later courses in Quantitative Analysis. Required in the Department of Chemistry. Professor McCay, assisted by Mr. Furman.

308. Quantitative Analysis, Part II. Continuation of Part I, including salts, minerals, alloys, and practice in combustions. This course involves about nine hours of laboratory work, in addition to one or more class

exercises, each week. Junior and senior course, second term, 3 hours a week. Prerequisite courses: General Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Part I. Prerequisite to the senior courses in Quantitative Analysis. Required in the Department of Chemistry. Professor McCay, assisted by Mr. Furman.

309. Physical Chemistry, Part I. Two lectures and one laboratory period. Walker: *Introduction to Physical Chemistry*. Findlay: *Practical Physical Chemistry*. Molecular theory and molecular weight determinations by standard methods. Junior and senior course, first term, 3 hours a week. Required in the Department of Chemistry. Professor Hulett.

For Honors: Application of the molecular weight methods to special problems and a study of exceptions to the general laws.

310. Physical Chemistry, Part II. Two lectures and one laboratory period. Bigelow: *Theoretical and Physical Chemistry*. Findlay: *Practical Physical Chemistry*. Theories of solutions, solubilities, determination of solubilities, conductivity, &c. Junior and senior course, second term, 3 hours a week. Required in the Department of Chemistry. Professor Hulett.

For Honors: Application of solubility and conductivity to analytic problems. Reading and laboratory work on the distribution of solutes between two solvents.

311. Historical and Theoretical Chemistry. Lectures and written recitations. Smith: *Inorganic Chemistry*; Dobbin and Walker: *Chemical Theory*; Ostwald: *Outlines of Theoretical Chemistry*. Junior elective course, first term, 3 hours a week. Prerequisite course: General Inorganic Chemistry. Professor McCay. [Not given 1913-1914.]

- *401. Quantitative Analysis, Part III. Tin-antimony alloys, ores, such as those of arsenic, antimony, iron, copper, etc., limestone, cement. This course involves about nine hours of laboratory work, in addition to one or more class exercises, each week. Senior course, first term, 3 hours a week. Prerequisite courses: General Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Parts I and II. Required in the Department of Chemistry in the four-year course. Professor McCay.
- *402. Quantitative Analysis, Part IV. Complicated substances, special methods, etc. This course involves about nine hours of laboratory work, in addition to one or more class exercises, a week. Senior course, second term, 3 hours a week. Prerequisite courses: General Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Parts I, II, and III. Required in the Department of Chemistry in the four-year course. Professor McCay.
- *403. Organic Chemistry, Part III. Continuation of Parts I and II, including the simpler cyclic compounds, particularly benzene and its derivatives. Lectures, recitations, and laboratory work. Perkin and Kipping: *Organic Chemistry*. Senior course, first term, 3 hours a week. Professor Neher.
- For Honors:* Special reading, conferences, and laboratory work, supplemented by brief reports on assigned topics.
- *404. Organic Chemistry, Part IV. Continuation of the preceding, including hydro-aromatic and heterocyclic compounds, terpenes, alkaloids, etc. Lectures, recitations, and laboratory work. Cohen: *Organic Chemistry for Advanced Students*. Senior course, second term, 3 hours a week. Professor Neher.

* Also listed as graduate course.

For Honors: Special reading, conferences, and laboratory work, supplemented by brief reports on assigned topics.

- *405. Physical Chemistry, Part III. One lecture and two laboratory periods. Nernst: *Theoretical Chemistry*. Ostwald - Luther: *Physiko - Chemische Messungen*. Equilibrium and the velocity of reactions. Senior course, first term, 3 hours a week. Professor Hulett.

For Honors: Reading on the Phase Rule and experimental application to practical problems.

- *406. Physical Chemistry, Part IV. One lecture and two laboratory periods. Nernst: *Theoretical Chemistry*. Ostwald - Luther: *Physiko - Chemische Messungen*. Electro-chemistry, Thermochemistry and Photochemistry. Senior course, second term, 3 hours a week. Professor Hulett.

For Honors: Reading on the single potential and hydrogen electrode with application to analytical and special problems. Reading on colloidal chemistry.

For regulations regarding Final Special Honors in Chemistry, see page 129.

For graduate courses in Chemistry, see the University Catalogue, pages 274 to 276.

XI. DEPARTMENT OF GEOLOGY

PROFESSORS SCOTT, PHILLIPS, SMYTH, FARR, AND VAN INGEN ;
DR. SINCLAIR, MR. HOWELL, AND MR. RESSER

301. Geology. Beginners' course, covering the subject in outline and designed both for those who intend to pursue the subject further, and for those who desire merely to obtain a general knowledge of the science.

* Also listed as graduate course.

- Scott: *Introduction to Geology*. Junior course, first term, 3 hours a week. Prerequisite to courses 302, 401. Professor Scott.
302. Introduction to Structural Geology. The interpretation of geological maps and sections, with study of the common rocks and their most important structural relations, and the elements of geological surveying. Essentially a laboratory course. Field work required of all students. Junior course, second term, 3 hours a week. Prerequisite course: Geology 301. Prerequisite to Geology 403. Dr. Sinclair.
303. Mineralogy. Lectures, recitations, and practice in theoretical, descriptive, and determinative mineralogy; a study especially of rock-forming minerals and the commoner minerals in general. Junior course, first term, 3 hours a week. Prerequisite course: General Chemistry. Prerequisite to courses 304, 403, 407. Professor Phillips.
304. Mineralogy. Lectures and laboratory work on crystallography and the optical properties of crystals. E. S. Dana: *Textbook of Mineralogy*. Junior course, second term, 3 hours a week. Prerequisite course: Mineralogy 303. Professor Phillips.
306. Introduction to Palaeontology. The scope, problems, methods, and results of the study of fossil organisms with special reference to those that have important geological relations. Alternate with Mineralogy 304. Junior course, second term, 3 hours a week. Lectures and conferences. Prerequisite courses: General Geology or Biology. Prerequisite to course 405. Professor van Ingen.
- *401, *402. Historical Geology. The geological history of the earth from its origin to recent times. The geographic, structural, and climatic changes, and the characteristic plants and animals of each period in its

* Also listed as graduate course.

- history. Lectures, conferences, and field work. Scott: *Introduction to Geology*; Chamberlin and Salisbury: *Geology, Volumes II and III*. Senior course, both terms, 3 hours a week. Prerequisite course: Geology 301. Professors Scott and van Ingen.
- *403. Structural and Dynamic Geology. A study of the composition and structural features of the earth's crust. Lectures, laboratory and field work. Senior course, first term, 3 hours a week. Prerequisite courses: Geology 302 and Mineralogy 303. Professor Smyth.
- *404. Economic Geology. The principles controlling the circulation of mineral matter in the earth's crust, and its concentration into workable deposits. Ries: *Economic Geology of the United States*; Kemp: *Ore Deposits of the United States*. Lectures and laboratory work. Prerequisite course: Geology 403. Senior course, second term, 3 hours a week. Professor Smyth.
- *405, *406. Invertebrate Palaeontology. Systematic palaeontology and evolution of the more important groups of extinct invertebrates; principles of stratigraphical geology. Lectures, laboratory, and occasional field work. Zittel-Eastman, *Palaeontology, Vol. I*. Senior course, both terms, 3 hours a week. Prerequisite course: Introduction to Palaeontology 306. Professor van Ingen.
- *407. Mineralogy. Lectures and laboratory work on the microscopical characters of the rock-forming minerals. Luquer: *Minerals in Rock Sections*. Senior course, first term, 3 hours a week. Prerequisite course: Mineralogy 304. Professor Phillips.
- *408. Petrology. The study of rocks, their mineralogical and chemical composition, structure, mode of occur-

* Also listed as graduate course.

rence, origin, and classification. Lectures and laboratory work. Harker: *Petrology for Students*. Senior course, second term, 3 hours a week. Prerequisite course: Mineralogy 407. Professor Smyth.

Summer Course in Field Geology. Juniors who contemplate electing the major part of their senior studies in the Department of Geology are strongly advised to take part in the optional field work which will be offered during a portion of each summer vacation.

For regulations regarding Final Special Honors in Geology, see page 130.

For graduate courses in Geology, see the University Catalogue, pages 276 to 277.

XII. DEPARTMENT OF BIOLOGY

PROFESSORS SCOTT, RANKIN, MC CLURE, CONKLIN, DAHLGREN,
AND FARR; DR. PATON; MR. C. F. SILVESTER, DR. L. R.

CARY, DR. HARVEY, MR. WARDWELL, MR. COAR,

AND MR. L. V. SILVESTER

201, 202. General Biology. Lectures, laboratory work, and recitations. An introduction to the fundamental properties of living things, their functions, structures, classification, habits, life-histories, and evolution. Selected forms are studied in the laboratory as illustrating the chief principles and generalizations of biology. Reference books: Sedgwick and Wilson: *General Biology*; Hegner: *Introduction to Zöology*. Sophomore elective for students in all courses, both terms, 3 hours a week. Prerequisite course, General Chemistry 103, 104, or its equivalent. Prerequisite to the subsequent courses in Biology. Professor Conklin and Dr. Cary, assisted by Professors Rankin and Dahlgren.

- 303, 304. Botany. Practical work in the field and laboratory, lectures and recitations. An introduction to the general principles of plant life. Besides the structure and functions of plants, their taxonomy and their relation to their environment will be studied, use being made of the facilities offered by the grounds of the University. Curtis: *Nature and Development of Plants*; Bergen and Davis: *Principles of Botany*. Junior course, both terms, 3 hours a week. Professor Rankin.
305. Comparative Osteology. Ontogeny and comparative structure of the skeletons of the different classes of vertebrates. Exercises in descriptive work. Each student must prepare a thesis on a skeleton specially assigned for his study. Flower: *Osteology of the Mammalia*; Reynolds: *The Vertebrate Skeleton*; monographs on the skull, the shoulder-girdle, human anatomy. Junior course, first term, 3 hours a week. Prerequisite course: Sophomore course in Biology. Professor Farr.
306. Invertebrate Zoölogy. Lectures and laboratory work on selected phyla of Invertebrates. Hertwig-Kingsley: *Manual of Zoölogy*; Drew: *Invertebrate Zoölogy*. Junior course, second term, 3 hours a week. Prerequisite course, General Biology 201, 202. Dr. Cary.
- *401. Comparative Anatomy of Vertebrates. Lecture and laboratory course. Lectures on the comparative anatomy of the organ systems of vertebrates, and dissection of the following forms: the dog-fish, the pigeon, and a mammal. Marshall and Hurst: *Practical Zoölogy*. Reference books: Wilder: *History of the Human Body*; Kingsley: *Vertebrate Zoölogy*; Wiedersheim: *Vergleichende Anatomie der Wirbelthiere*. Senior course, first term, 3 hours a week. Prerequisite

* Also listed as graduate course.

site courses : Sophomore and junior courses in Biology. Professor McClure and Mr. C. F. Silvester.

- *402. Vertebrate Embryology. Lecture and laboratory course. A comparative study of the development of vertebrates. Hertwig: *Textbook of Embryology*; McMurrich: *The Development of the Human Body*. Senior course, second term, 3 hours a week. Prerequisite course: Comparative Anatomy 401. Professor McClure and Mr. C. F. Silvester.
- *403. Histology. A study of protoplasm, cells, and tissues as they underlie animal and vegetable life. Required textbook: Dahlgren and Kepner: *Principles of Animal Histology*. Reference books: F. T. Lewis: *Stohr's Text Book of Histology*; Schneider: *Histologie der Thiere*; Wilson: *The Cell in Development and Inheritance*. Senior course, first term, 3 hours a week. Prerequisite course: Biology 201, 202. Professor Dahlgren.
- *404. Advanced Histology, and Neurology. The comparative Histology of the nervous tissues and neuroglia: an outline of the structure of several important types of nervous systems including the vertebrate type; and work on several other special groups of tissues. Practice in microscopical technic. Thesis. Required textbooks: Dahlgren and Kepner: *The Principles of Animal Histology*; J. B. Johnson: *The Nervous System of Vertebrates*. Senior course, second term, 3 hours a week. Professor Dahlgren.
- *406. Vertebrate Palaeontology. Lectures and laboratory work on fossil vertebrates. Smith-Woodward; *Vertebrate Palaeontology*; Zittel: *Handbuch der Palaeontologie*. Senior course, second term, 3 hours a week. Prerequisite courses: Biology 201, 202, and Osteology 305. Professors Scott and Farr.

* Also listed as graduate course.

- *407, *408. General Physiology. Lectures and laboratory work. An introduction to the phenomena exhibited by living matter. The substances of which organisms are composed will be studied and their rôle in the functioning of the cell discussed. The general physiology of muscle and nerve tissue, of the digestive tract (including absorption, nutrition, secretion and excretion) and of the circulatory system (including respiration) will then be taken up, followed by an account of the coördinate activities of the nervous system, reflexes, tropisms, and the phenomena of reproduction, growth and regeneration. Howell's *Text Book of Physiology*. Senior course, both terms, 3 hours a week. Prerequisite course: Biology 201, 202. Dr. Harvey, assisted by Mr. Wardwell.
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For regulations regarding Final Special Honors in Biology, see page 133.

For graduate courses in Biology, see the University Catalogue, pages 277 to 280.

XII. DEPARTMENT OF ASTRONOMY

PROFESSORS RUSSELL AND DUGAN

301. Astronomy. Elementary Astronomy. Mainly descriptive, exhibiting the leading facts regarding the solar system and an elementary explanation of the methods by which they are ascertained. Recitations on textbook, with lectures. Young: *Manual of Astronomy*. Junior course, first term, 3 hours a week. Professor Russell.
302. Astronomy. Stellar Astronomy. A review of the present state of knowledge concerning the stars. Stellar positions, proper-motions, radial velocities, and parallaxes; group and stream motions, visual and spectro-

* Also listed as graduate courses.

- scopic binaries; stellar spectra, colors, and temperatures; variable and new stars; masses and densities of the stars; characteristics of different spectral types; distribution of the stars in space; clusters and nebulae; theories of stellar evolution. Lectures. Junior course, second term, 3 hours a week. Professor Russell.
303. Astronomy. Elementary astronomy for engineers. Lectures and recitations from textbook, with special reference to preparation for Geodesy 302. Young: *Manual of Astronomy*. Required of all C.E. juniors, first term, 3 hours a week. Professor Dugan.
304. Astronomy. Practical Astronomy. Determination of time, latitude, and azimuth. Practice with the transit instrument, sextant, and theodolite. Determination of latitude with the zenith telescope. Required of all C.E. juniors, second term, 2 hours a week. Professor Dugan.
- *401, 402. Astronomy, f. Honors Course in Celestial Mechanics. Open to candidates for Honors in Mathematics and Physics. Elliptic motion; determination of orbits; disturbed motion; tidal evolution. Senior course, both terms, 3 hours a week. Prerequisite: Sophomore Honors Course in Mathematics. Professor Russell.
403. Astronomy. Practical Astronomy. The principal methods and instruments of astronomical observation; determination of latitude and time; work with the sextant, transit, equatorial, and spectroscope. Classroom exercises, with observatory work. Campbell: *Elements of Practical Astronomy*. Senior course, first term, 3 hours a week. Prerequisite course, Astronomy 301. Professor Dugan.

* Also listed as graduate course.

For regulations regarding Final Special Honors in Astronomy, see page 134.

For graduate courses in Astronomy, see the University Catalogue, pages 270 to 271.

XIII. DEPARTMENT OF HYGIENE AND PHYSICAL EDUCATION

PROFESSORS RAYCROFT, FAUVER, AND LUEHRING; MR. SULLIVAN AND MR. FOGGITT

The aim of the work in this department is to promote the general health and physical efficiency of the students. All members of the freshman class are required to take regular work as indicated below.

Physical Examinations. Each student is given a careful physical examination which serves as a basis for advice as to special corrective exercises, if needed, and an opportunity for a discussion with each individual on the various practices and habits that affect his physical and mental efficiency. This examination includes a few anatomical measurements; strength tests for determining muscular efficiency; and an examination of the eyes, ears, nose, throat, and the vital organs. Professors Raycroft, Fauver, and Luehring; and Mr. Foggitt.

Graded Exercises. The work consists of a large variety of games and exercises conducted under the supervision of the department. It is graded to meet the needs and ability of those in the classes, and is conducted out-of-doors whenever possible. The student may select the squad or class with which he will work. Every freshman must pass a test in swimming. Classes are organized for beginners. Life-saving and methods of resuscitation are taught advanced classes. Required of all freshmen, both terms, 3 hours a week. Professors Fauver and Luehring; Mr. Sullivan and Mr. Foggitt.

Personal Hygiene. Lectures and recitations. A discussion of the fundamentals of health and physical efficiency; the influence of diet, exercise, bathing and sleep; the effects of personal habits; the use of alcohol and tobacco; and a study of the more common infectious diseases—their nature, causes, methods of transmission and prevention. The lectures will be illustrated by the use of manikins, diagrams, and lantern slides. Reference books: Hough and Sedgwick, Woodhull, and Pyle. Freshman course, both terms, 1 hour a week. Professors Raycroft, Fauver, and Luehring.

COURSES FALLING UNDER DIVISION C, BUT WHICH
ARE NOT INCLUDED IN ANY ONE OF THE
PRECEDING DEPARTMENTS

Graphics 203. Elementary Mechanical Drawing. A beginners' course. Willson: *Theoretical and Practical Graphics*. Elective, open only to B.S. and Litt.B. sophomores who elect Mathematics at the same time. First term, 3 hours a week. Prerequisite to Graphics 204. Mr. McWilliams.

Graphics 204. Curve construction, structure drawing, intersections, etc. Lectures. Willson: *Graphics*. Elective course, open only to B.S. and Litt.B. sophomores who have elected both Mathematics 201 and Graphics 203, and who elect Mathematics 202 during the second term. Second term, 3 hours a week. Professor Willson and Mr. McWilliams.

Graphics 302. Shadows, perspective, and valve-motion. Lectures, illustrated with lantern slides, textbook work, and practical problems on the drawing board. Willson: *Shadows and Perspective*; Halsey: *Slide Valve Gears*. Junior course, second term, 3 hours a week. Open only to such candidates for bachelors' degrees as intend to study Architecture or Engineering

subsequent to graduation. Professor Willson, Mr. McWilliams, and Mr. Aymar.

Graphics 303. Descriptive Geometry. A lecture and text-book course on the fundamental problems of the point, line, and plane, followed by their application to developable, double-curved, and warped surfaces, and including trihedrals and spherical projections, practically applied in the solution of a large number of problems on the drawing-board. Willson: *Descriptive Geometry*. Junior course, first term, 3 hours a week. Mr. McWilliams.

Graphics 401. Stereotomy. Descriptive geometry applied to the solution of such problems in stone cutting as are likely to arise in railroad or architectural construction. A lecture and drafting-room course. Senior course, first term, 2 hours a week. Open only to such candidates for bachelors' degrees as intend to study Architecture or Engineering subsequent to graduation. Professor Willson and Mr. Aymar.

Geodesy 304. Surveying. A general outline of methods of surveying and their uses. Raymond: *Surveying*. Junior course, second term, 3 hours a week. Professor Harris.

Graphical Statics 304. Review of general principles of force polygons and of funicular polygons. Extensions to complex problems. Illustrations and drill in the solution of numerous examples drawn from statical and dynamical engineering, involving direct stresses, and flexural, shearing, and torsional stress; also moments of inertia and centers of gravity of irregular figures. Lectures, aided by Merriman and Jacoby, Part II. Reference book: Eddy: *New Constructions in Graphical Statics*. Junior course, second term, 3 hours a week. Prerequisite courses: Graphics, Physics, Mechanics. Mr. de Forest, under the direction of Professor McMillan.

Theory of Prime Motors (Civil Engineering 403). General relations of the factors of energy and power considered analytically and graphically; reduction of inertia and all resistances to driving point; efficiency; general theory of water motors (rotative); thermal motors:—combustion, calorific powers of fuels, theory of chimney-draft, efficiency of generator. Rankine: *Steam Engine and Other Motors*. Reference books: Ewing: *The Steam-Engine and Other Heat-Engines*; Ennis: *Applied Thermodynamics*; Weisbach: *Hydraulic Motors*. Senior course, first term, 3 hours a week, with laboratory work. Prerequisite courses: Physics, Mechanics (Analytical and Graphical), Chemistry. Prerequisite to Theory of Prime Motors (Civil Engineering 404). Professor McMillan and Mr. de Forest.

Theory of Prime Motors (Civil Engineering 404). Recitations and lectures, general equations of thermodynamics, expansion and compression curves of gases and vapors, diagrams of energy—[p. v. and t. e.]; modifying causes of diagrams; compound engines; explosive or combustion engines:—Otto cycle; compression and expansion curves; combustion engines with carburetting; oil-engines. Rankine: *Steam Engine and Other Motors*. Reference books: Ewing; Ripper, Ennis; Clerk: *Gas Engine*. Senior course, second term, 3 hours a week, with laboratory work. Prerequisite courses: Physics, Applied Mechanics (Analytical and Graphical), Chemistry. Professor McMillan and Mr. de Forest.

Physical Geography 302. Morphology of the continents. Guyot: *Physical Geography*; *Earth and Man*; Davis: *Physical Geography*; Tarr: *Elementary Physical Geography*; Mill: *Realm of Nature*. Junior course, second term, 3 hours a week. Professor Libbey.

HONORS

OPEN TO CANDIDATES FOR A BACHELOR'S DEGREE

Honors are of two kinds, *General* and *Special*.

General Honors are awarded for general excellence in studies at the close of freshman and sophomore years according to the following provisions: At the close of the freshman and sophomore years High General Honors are given to those whose average rank for the year is within the first general group, and General Honors to those whose average rank for the year is within the second general group. No General Honors are awarded after the sophomore year.

Special Honors are awarded for excellence in single leading departments of study at the close of the freshman and sophomore years in accordance with the following provisions: High Special Honors are given to those whose average rank for the year is in the first group in any subject and Special Honors to those whose average rank for the year is in the second group in any subject.

FINAL SPECIAL HONORS

Final Special Honors are based on the work of the junior and senior years and are awarded at graduation only. They are of three grades, Highest Honors, High Honors and Honors, and are awarded in accordance with the following provisions:

1. Every junior or senior in candidacy for a bachelor's degree who is enrolled as a candidate for Final Special Honors shall have a schedule of four courses, of which at least two shall be in some one department.
2. A candidate for Final Special Honors shall do more

advanced work in the courses of his department than is required of a student who is enrolled under the general plan of study.

3. A student who has attained a standing of first or second general group at the end of sophomore year may be enrolled as a candidate for Final Special Honors on his own request.

A student whose standing at the end of sophomore year is not lower than the third general group, and within the first or second group in the department he proposes to enter or in courses preliminary thereto, may be enrolled on his own request as a candidate for Final Special Honors in that department.

Any student who at the end of sophomore year falls short of these requirements may be so enrolled only on the recommendation of the department or departments concerned.

A student who has been enrolled under the general plan of study during his junior year but who during that year has maintained a general standing of first or second general group may be enrolled, at the beginning of his senior year, as a candidate for Final Special Honors on the recommendation of his department.

Final Special Honors may be awarded to a senior who has not taken the junior year in Princeton.

4. A candidate for Final Special Honors who fails during any term to maintain a definite standing shall be required to enroll under the general plan of study for the next term, during which time he may qualify for re-enrolment for Final Special Honors.

5. Final Special Honors shall be based upon the average standing which a student has maintained in the courses of his department for junior and senior years.

DEPARTMENT OF PHILOSOPHY

Two courses in Philosophy are to be taken throughout junior and senior years.

Final Special Honors may be taken either in Philosophy or in Psychology. In Philosophy the additional Honors work shall be as follows:

Plato, *Republic**
 Aristotle, *Ethics*
 Descartes, *Meditations**
 Berkeley, *Principles of Human Knowledge**
 Hume, *Enquiry Concerning the Human Understanding**
 Spinoza, *Ethics*
 Leibnitz, Selections
 Kant, *Critique of Pure Reason**
 Kant, *Critique of Practical Reason*
 Green, *Prolegomena to Ethics*
 Sigwart, *Logic** (portions only)
 William James, *Principles of Psychology**

[Note: The books marked by an asterisk are already employed, in whole or part, as reading in the regular courses.]

In Psychology the additional Honors work shall be as follows:

Reading and research in

(1) Color Vision

Space Perception (analytic, genetic, experimental, theory)

Association (historical, experimental)

Emotion (theories, laboratory tests)

Attention and Volition

Psychophysical Methods and Problems, and

(2) British Philosophy from Bacon to Hume, with reading of

Locke, *Essay Concerning the Human Understanding* (portions only)

Berkeley, *Principles** and *Dialogues*

Hume, *Treatise on Human Nature* (Book I)

Leibnitz, Selections

Candidates for Final Special Honors in Psychology shall take at least one course in Psychology in each term of junior and of senior years.

Candidates for Final Special Honors in Philosophy (and Psychology) shall take the usual term examinations in junior and senior years, except that in place of the regular second term senior examinations a set of final examinations on the additional Honors work of junior and senior years will be substituted.

Each candidate for Final Special Honors is also required by March 14th of senior year to present a thesis on some central topic;—the subject proposed to be reported to and approved by the department not later than the close of junior year.

DEPARTMENT OF HISTORY AND POLITICS

1. Candidates for Final Special Honors in the Department of History and Politics shall take:

- (1) Two courses in the department, together with Junior Economics, in junior year, doing the regular preceptorial and classroom work and passing all tests and examinations given in those three courses.
- (2) Two of the senior courses offered by the department, doing the regular preceptorial and classroom work, and passing all tests and all examinations, except the final regular examination in the two courses of senior year in which they are pursuing Honors work. In place of this regular examination, candidates for Final Special Honors shall take an Honors examination covering the entire period of their Honors studies.

2. In place of the fifth course required of students not in candidacy for Honors, candidates for Final Special Honors will be required to do more extensive and advanced work in the courses which they may select. The Honors work will consist of supplemental reading and additional exercises and reports.

A statement of Honors reading will be issued.

DEPARTMENT OF ECONOMICS AND SOCIAL
INSTITUTIONS

Candidates for Final Special Honors in this department shall have attained second general group at the end of sophomore year, or third general group with second group in Sophomore History.

Applications from other students who have done good work in Mathematics, History and Philosophy in their freshman and sophomore years will be considered by the department.

The courses required in the department throughout the junior and senior years are:

- 305, 306. Principles of Economics
- 307, 308. Historical and Descriptive Economics
- 409, 410. Money and Banking, Public Finance
- 411, 414. Economic Policy, Social Economics

All departmental students are required to take History and Politics 303, 304, Constitutional Government and Jurisprudence.

An Honors section will be formed in each of the junior courses.

It is expected that a comprehensive examination will be given in the Honors Course at the end of the senior year.

A statement of Honors reading will be issued.

DEPARTMENT OF ART AND ARCHAEOLOGY

Two courses in the department are required throughout the junior and senior years. A statement of the plan for additional reading to be done for Honors will be issued. At present no comprehensive final examination is contemplated. All the term examinations are to be taken. Special stress will be laid on the preparation of a thesis.

DEPARTMENT OF CLASSICS

The instruction of the junior and senior years is organized so as to constitute an Honors course in Classics. Courses are also offered for students who are not candidates for

Honors in the department. The two classes of students are not united in any Honors course except for lectures.

The purpose of the Honors course is not philological or scientific, but literary, historical, and philosophical. The aim is to make clear through lectures, recitations, and the intimate personal intercourse of the preceptorial conferences the fundamentally valuable lessons of antiquity for modern thought and life. The reading of selected masterpieces of the ancient writers is a necessary part of the course. Certain parts of the reading will be slow and critical, but it is also intended to develop the practice of fluent and copious reading.

The complete range of electives is naturally open only to those who have studied both Greek and Latin, but a sufficient number of electives is provided for those who have studied Latin only. Candidates for the degree of Bachelor of Arts may become candidates for Final Special Honors in Classics. Candidates for the degree of Bachelor of Letters may become candidates for Final Special Honors in Latin.

Admission to the courses leading to Final Special Honors in the department of Classics is granted in accordance with the general regulations printed on page 117. The following special regulations govern the work of candidates for Honors in the department:

1. All candidates for Final Special Honors in the department must take two of the courses designated as Honors courses through junior and senior years.

2. Candidates for the degree of Bachelor of Arts who are candidates for Final Special Honors in Classics must select as one of their two Honors courses a course involving the reading of Greek authors through junior and senior years.

3. Candidates for the degree of Bachelor of Letters who are candidates for Final Special Honors in Latin must select as one of their two Honors courses a course involving

the reading of Latin authors through junior and senior years.

4. Candidates for Final Special Honors will not be credited with more than four courses in any term. Courses in addition to these may be taken only by the consent of the Departmental Committee on the Honors Course, and shall be recorded only as optional, not counting toward a degree.

5. Students who are qualified to become candidates for Final Special Honors in the Department of Classics, but have become candidates for Honors in other departments, may, with the consent of the Departmental Committee on the Honors Course, choose as electives courses designated as Honors courses.

6. Courses not designated as Honors courses may be taken as free electives by candidates for Honors in the department. Candidates for Final Special Honors in the Department of Classics must choose their two departmental courses from the following list:

Junior Courses

First Term: Latin Literature 317, Roman History 305, Aeschylus and Sophocles 313, Homer 311.

Second Term: Latin Literature 318, Roman History 306, Greek Lyric Poets 310, Plato 312.

Senior Courses

First Term: Lucretius 401, Cicero 405, Roman Law 419, Greek History 403, Thucydides 409.

Second Term: Virgil 412, Tacitus 414, Roman Law 420, Greek History 404, Aristotle 410, Classical Influences 416.

Students not candidates for Honors in the Department of Classics may elect any of the following courses (but see above, par. 5):

Junior Courses

First term: Latin Literature 317, Cicero's Letters 307, Aeschylus and Sophocles 313, Homer 311.

Second Term: Latin Literature 318, Plautus 316, Greek Lyric Poets 310, Plato 312.

Senior Courses

First Term: Lucretius 401, Roman Law 419, Aristophanes 415.

Second Term: Virgil 412, Roman Law 420, Classical Influences 416.

DEPARTMENT OF MODERN LANGUAGES

Candidates for Final Special Honors will be enrolled in the regular courses of the department but shall report in separate preceptorial groups.

1. *Honors Reading: A. Germanic Section:* Either additional intensive work along the lines of the regular courses, or specialized work in the following subjects:

- a. The Drama
- b. The Novel
- c. Non-dramatic Poetry
- d. Literary Criticism

[Note: A candidate for Final Special Honors must previously have taken Sophomore German 203-204.]

B. *Romanic Section:*

- a. The Drama
- b. The Novel
- c. Non-dramatic Poetry
- d. Criticism and Literary Theories
- e. History and Memoirs

2. *Reports.* Candidates for Final Special Honors shall make reports, written or verbal, at such times as may be required. At least one such report each term shall be in writing.

3. *Examinations:*

- a. Candidates for Final Special Honors shall be required to pass the regular examinations at the close of each term in junior year, but the subject matter of the extra reading on which they have made reports will not be embraced in these examinations.

- b. Seniors in Honors work will be excused from the regular senior examinations in the department, but a final comprehensive examination, to be given during the senior examination period and covering all the Honors work (that is, the two departmental courses and the additional reading) done during junior and senior years, will be given at the close of senior year.
 - c. This comprehensive examination shall consist of two sections, one of four hours, which shall cover the work done in the regular courses; and another one of four hours, which shall cover the work done in the candidate's special field of study.
 - d. An oral examination may also be given to Honors candidates at the close of senior year.
- A statement of Honors reading will be issued.

DEPARTMENT OF ENGLISH

A candidate for Final Special Honors in English must take the following courses:

Junior Year

- | | |
|--------------|--|
| First term: | 301. English Literature of the Sixteenth Century |
| | 303. History of the English Language |
| Second term: | 302. Shakespeare |
| | 304. Elementary Old English |

Senior Year

- | | |
|--------------|--|
| First term: | 401. Restoration and Eighteenth Century Literature |
| | 403. English Poetry (or Prose) of the Nineteenth Century |
| | 405. Advanced Old English |
| Second term: | 402. Seventeenth Century Literature |
| | 404. English Prose (or Poetry) of the Nineteenth Century |
| | 406. Chaucer and his Contemporaries |

Each candidate shall adopt a consistent, definite, and properly limited plan of study beyond the scope of his course.

At the end of senior year each candidate shall pass an examination based upon all his work in English during junior and senior years.

Each candidate shall follow a prescribed course of reading in extension of the work of each course. At the final comprehensive examination the candidate must present a general knowledge of English history and of the history of the English language and literature.

The special work for honors should be chiefly either in literature or in linguistics, as follows:

LITERATURE

A candidate wishing to specialize in Literature shall select for intensive study during junior and senior years one of the following topics:

1. Old English Literature
2. Middle English Literature
3. The Sixteenth Century (1485-1616)
4. The Seventeenth Century (1591-1702)
5. The Eighteenth Century (1660-1793)
6. The English Romantic Movement
7. Victorian Literature (to the death of Tennyson)
8. English Literature and Political History
9. English Literature and Philosophy
10. English Literature and French, or German, or Italian Literature
11. English Literature and the Classics
12. Theories of Poetry and Fine Art
13. The Development of a Single Literary Form
14. A Single Author

Note on Topics 1-7. In connection with any of these topics the candidates shall follow a course of reading illustrating the English philosophy and history of the period, and the origins of its main tendencies.

Note on Topics 8-II. As these topics present English literature particularly in its relation to other subjects, a candidate's choice will usually relate itself to his choice of courses outside of the department.

Note on Topic 10. As the relations of English literature to these others vary in importance from period to period, the candidate may include more than one of them in his plan, or may confine himself to a more intensive study of one of them in a particularly significant period; such as, for example, English Literature and French Literature of the Eighteenth Century; English Literature and Italian Literature in the Sixteenth Century.

Note on Topics 8-13. The special study of any one of these topics shall be followed in close connection with the candidate's courses in English literature.

LINGUISTICS

A candidate wishing to specialize in Linguistics shall read selected books on the phenomena of language, on the relation of English to kindred languages, and on the elements of style.

His intensive study shall have as its subject the relation of English to one other language, or the language and style of some selected author.

The candidate shall from time to time in each term report progress in his special reading to his preceptor, and shall do such writing in connection with it as his preceptor shall prescribe.

A statement of Honors reading will be issued.

DEPARTMENTS OF MATHEMATICS AND PHYSICS

The Honors courses in these departments in the junior and senior years remain the same as hitherto. The sophomore courses in Mathematics and Physics are no longer included in the Honors courses, but are preliminary thereto.

I. The Curriculum.

Junior Year

- A. Geometry
- B. Analysis
- C. Applied Mathematics (Mechanics)
- D. Theoretical Physics
- E. Experimental Physics

Each course is a three-hour course. A junior is to select three courses from the above table. Unless permitted a different choice by the department, he must select C as one of these courses. In addition he selects an elective (3 hours) in some other department than the Departments of Mathematics and Physics.

Senior Year

- a. Geometry or Algebra
- b. Analysis
- c. Applied Mathematics (Electricity and Magnetism)
- d. Theoretical Physics
- e. Experimental Physics
- f. Celestial Mechanics

Courses A, B, C, D, E of junior year are prerequisite to the courses a, b, c, d, e of senior year respectively. The senior year schedule shall consist of three courses selected from the Honors courses and of an additional elective (3 hours) outside the Departments of Mathematics and Physics. The three Honors courses may be selected from those of the courses a, b, c, d, e, f, of which the prerequisites have previously been taken, or from those of the courses A, B, C, D, E which have not previously been taken.

A senior electing course b must elect course A if he has not already taken it. A senior electing course a must elect course B if he has not already taken it.

2. Students who have been ranked in freshman year in the First or Second Group in Mathematics may enter the courses preliminary to Honors in Mathematics and

Physics at the beginning of sophomore year. Other candidates from the same class may be admitted on recommendation of the Departments of Mathematics and Physics.

Candidates may also enter the Honors course at the beginning of junior year, if they satisfy the Departments of Mathematics and Physics of their ability to maintain a satisfactory standing.

3. Those who satisfactorily complete the required courses will receive Honors, with such grades of distinction as are now given in Mathematics and Physics. No Honors will be given in Mathematics and Physics except to those taking these courses.

4. A student who does not maintain a satisfactory standing in the Honors Course will be required to leave the course, and to choose a course of study under the general plan.

At the end of any year a student may withdraw from the Honors Course, and choose a course of study under the general plan.

5. Attendance on the Honors Courses is on the same footing as attendance upon preceptorial conferences.

DEPARTMENT OF CHEMISTRY

Candidates for Final Special Honors in Chemistry shall take two courses in Chemistry throughout Junior and Senior years in conformity to the plan outlined below.

In courses which are mainly of an introductory character, such as the first courses in qualitative and quantitative analysis, organic chemistry and physical chemistry, honors students will be required to do additional reading, or additional laboratory work, or both. They will meet in special divisions for recitations and conferences and will be given special examinations upon the work of the courses. In the more advanced courses, the work of honors students will be further distinguished in subject matter as well as in quality and quantity, and, when necessary or advisable, entirely

separate courses will be arranged for the accommodation of honors men.

In place of the regular term examinations at the end of senior year, comprehensive final examinations upon the honors work of both junior and senior years will be held.

Junior Year

1. Either Qualitative Analysis throughout year, or
Quantitative Analysis I, II, in case qualitative
analysis has already been taken
- and
2. Either Organic Chemistry I, II, or
Physical Chemistry, I, II

Senior Year

- A. For students who have taken Qualitative Analysis in junior year.
 1. Quantitative Analysis I, II
 2. Either Physical Chemistry I, II, or
Organic Chemistry I, II
(the one not taken in junior year)
- B. For students who have taken Quantitative Analysis I, II in junior year.
 1. Either Physical Chemistry I, II, or
Organic Chemistry I, II
(the one not taken in junior year)
 2. An elective from the following group:
General Chemistry III, IV
Quantitative Analysis III, IV
Organic Chemistry III, IV
Physical Chemistry III, IV

[Note: In explanation of the above it should be stated that General Chemistry III, IV and Organic Chemistry IV and Physical Chemistry III, IV are new courses not to be given until 1914-1915.]

DEPARTMENT OF GEOLOGY

Candidates for Final Special Honors shall take the two

departmental courses of junior year and at least three of the four courses of senior year.

The courses now central to the department are prescribed for the honors scheme. They comprise two in junior and two in senior year, and are marked with a letter (C) on the subjoined list.

The specific honors work consists of additional reading, laboratory and field work, as outlined below:

1. Candidates for Final Special Honors will be expected to read during their two years the following works:

Dutton, *Tertiary History of the Colorado Canyon*

Gilbert, *Lake Bonneville*

Lyell, *Principles of Geology*

De la Beche, *Geological Observer*

Willis, *Mechanics of Appalachian Structure* (13 Ann.

Rept. of U. S. Geological Survey)

Geikie, *Founders of Geology*

Suess, *Face of the Earth*; selected chapters

Powell and others, *Physiography of the United States*

Blackwelder, *Geology of North America*

Palaeontological Society Conference Papers on the Aspects of Palaeontology

Bernard, *Principles of Palaeontology*, translation in 48th

Report, Regents University State of New York, vol. ii, pp. 127-215

Brauns, *The Mineral Kingdom*

Merrill, *History of American Geology*

Geikie, *Ancient Volcanoes of Great Britain*

Merrill, *Rocks, Rock Weathering and Soils*

2. Additional work in connection with individual courses:

C. 301. Introduction to Geology

Laboratory work consisting of study of the structural geology collections illustrating Scott's textbook. Attendance upon a certain number of field trips with preparation of a report on each. Use of Geikie's *Textbook of Geology*, vol. i, in preceptorial work

C. 302. Structural Geology

Two extra field trips with reports thereon.

Mapping of special district. Reading of special chapters in Geikie, *Structural and Field Geology*; Hayes, *Handbook for Field Geologists*; Farrell and Moses, *Practical Field Geology*.

- C. 303. Mineralogy
Study of a special collection of minerals comprising 150 species.
304. Crystallography
Extra reading to be designated, and additional drawing of crystal forms with cutting of crystal models.
306. Introduction to Palaeontology
Laboratory work on special collections of fossils, plants and animals. Reading of chapters in Zittel-Eastman, and special papers in journals.

[Note: Either 304 or 306 must be taken.]

- C. 401, 402. Historical Geology
Extra reading: Geikie, *Textbook of Geology*, vol. ii.; Schuchert, *Palaeogeography of North America*; Ulrich, *Revision of the Palaeozoic Systems*; study of certain Geologic Folios; take part in four field trips during each term and prepare report on each; and study a collection of index fossils of the geological formations.
- C. 403, 404. Dynamic and Economic Geology
Reading of chapters in VanHise, *Metamorphism* and other monographs of the U. S. Geol. Survey; Harker, *Natural History of Igneous Rocks*; Posepny and others, *Genesis of Ore-Deposits*; Clark, *Data of Geochemistry*; Elsdon, *Principles of Chemical Geology*. Study of geologic folios.
- 405, 406. Invertebrate Palaeontology
The collection, identification and correlation of a fauna, with reading or special papers on the principles of stratigraphy and palaeontology. Study of geologic folios.
407. Optical Mineralogy
Two hours additional laboratory work on goniometer and refractometer. Study chapters of

Miers, *Mineralogy*; Groth-Jackson, *Optical Mineralogy*.

408. Petrology

Two additional hours of laboratory work. Study Iddings, *Igneous Rocks*; Iddings, *Origin of Igneous Rocks*; Kemp, *Handbook of Rocks*.

302. Physical Geography

Extra Reading:

Salisbury and Atwood, *Interpretation of Topographical Maps*

Russell, *Rivers of North America*

Russell, *Lakes of North America*

Russell, *Glaciers of North America*

Dutton, *Earthquakes*

Poulett-Scrope, *Volcanoes*

Dana, *Volcanoes*

Geikie, *Earth Sculpture*

DEPARTMENT OF BIOLOGY

1. Candidates for Final Special Honors in Biology must take the course in General Biology (201, 202) either in their sophomore or junior year.

2. In junior year they must take:

Advanced General Biology (301) (New course for honors candidates); 3 hours a week, 1st term.

Invertebrate Zoology (306): with 3 hours a week supplementary work in reading and laboratory work, 2nd term.

Botany (303, 304); with 3 hours a week supplementary reading and laboratory work, both terms.

3. In senior year they must take:

Comparative Anatomy (401); with 3 hours a week supplementary reading and laboratory work, 1st term. Vertebrate Embryology (402); with 3 hours a week supplementary work, 2nd term.

General Physiology (407, 408); with 3 hours a week supplementary work and laboratory work, both terms.

[Note: Supplementary work for honors candidates will be offered in Histology 403, 404 for those who desire it.]

4. In addition to the supplementary work in connection with each of the courses named, candidates for Final Special Honors in Biology shall read the following works before the close of senior year and pass an oral examination on them:

Darwin, *Origin of Species*
 Darwin, *Voyage of the Beagle*
 Huxley, *Introduction of Zoölogy*
 Huxley, *Man's Place in Nature*
 Wallace, *Malay Archipelago*
 Beddard, *Geographical Distribution*
 Locy, *Biology and its Makers*
 Kellogg, *Darwinism Today*
 Jennings, *Behavior of the Lower Organisms*
 Wheeler, *Ants*
 Walter, *Genetics*
 Davenport, *Heredity in Relation to Eugenics*

DEPARTMENT OF ASTRONOMY

The courses at present offered are:

Junior Year

First term: 301. Elementary Astronomy

Second term: 302: Stellar Astronomy

Senior Year

First term: 403. Practical Astronomy

Both terms: 401, 402. Celestial Mechanics

In junior year, candidates for Final Special Honors in Astronomy shall take one course in each term in some subject cognate to that of their department.

This course will be assigned in each individual case by the department, after conference with the student. To be eligible to courses 401, 402, a student must be familiar with the differential and integral calculus, and the elements of differential equations.

The work planned for the two years is as follows:

Junior Year

Study of the heavens with the naked eye. Identifica-

tion of stars, planets and other heavenly bodies, and study of their motions, both by observation and with the aid of ephemerides. Study of astronomical photographs of the moon and stars.

Books of reference: Schurig, *Himmels-Atlas*; American Ephemeris.

Senior Year

Telescopic observation of the heavenly bodies. Study of special problems in Practical Astronomy. Readings on selected topics in current astronomical literature.

DEPARTMENT OF CIVIL ENGINEERING

PROFESSORS MC MILLAN, WILLSON, SMITH, AND HARRIS; MR. MC WILLIAMS, MR. AYMAR, MR. PLACE, MR. BOLMER, MR. BREWSTER, MR. CONDIT, AND MR. DE FOREST

English 101, 102, *a*. Selected authors for special study and for general reading. The principles of composition and rhetoric will be derived therefrom. Frequent reports on assigned reading. Required of all C.E. freshmen who do not take English 101, 102, *b*, both terms, 2 hours a week. Professor Covington. Preceptors, Professors Croll, Heermance, MacDonald, Miles, and Root.

English 101, 102, *b*. To freshmen who enter the Cliosophic or the American Whig Society there is offered, as a substitute for 101, 102, *a*, an elective course in Public Speaking and Debate. Required of all C.E. freshmen who do not take English 101, 102, *a*, both terms, 2 hours a week. Professor Covington, assisted by Mr. van Winkle in the American Whig Society, and Professor Heermance in the Cliosophic Society.

Physics 101, 102. General Physics. General course in physics, including lectures, recitations, and laboratory work. Reed and Guthe: *College Physics*. Required of all C.E. freshmen, both terms, 4 hours a week. For this course a fee of \$5 is charged, and a deposit on apparatus of \$5 is required. Professors McClenahan, Trowbridge, Cooke, and Northrup; Mr. Stevens, Mr. Smith, Mr. Carson, Mr. Rogers, Mr. Sherwood, Mr. Kieffer, and Mr. Waterman.

Mathematics 103. Selected Portions of Algebra. Undetermined Coefficients, Division Transformation, Par-

tial Fractions, Elementary Theory of Equations, Permutations and Combinations; Review of Plane Trigonometry; Elements of Spherical Trigonometry. Fine: *College Algebra*; Hun and MacInnes: *Elements of Plane and Spherical Trigonometry*. Required of all C.E. freshmen, first term, 4 hours a week. Professors Swift and MacInnes.

Mathematics 108. Coördinate Geometry, treated from the Cartesian standpoint. Fine and Thompson: *Coördinate Geometry*. Required of all C.E. freshmen second term, 4 hours a week. Professors Fine, Thompson, Gillespie, Hun, MacInnes, Swift, and Wedderburn; Dr. Dederick, Mr. Gilman, and Dr. Gronwall.

Chemistry 101, 102. General Inorganic Chemistry. Experimental lectures on the elements and their compounds, supplemented by laboratory work. Two lectures, one recitation, and one laboratory exercise of 3 hours each week. Smith: *General Chemistry for Colleges*. Required of all C.E. freshmen, both terms, 4 hours a week. Professor Van Nest, assisted by Mr. Jennings.

Graphics 101. Elementary technical drawing. Line and brush work, conventional representations, lettering, trochoidal curves, oblique and orthographic projections, working drawings, and tracing. Willson: *Theoretical and Practical Graphics*. Required of all C.E. freshmen, first term, 2 hours a week. Professor Willson, Mr. McWilliams, and Mr. Aymar.

Geodesy 101, 102. Land surveying. Theory of chain and compass surveying. Surveys of public lands. Leveling. Lectures and recitations. Staley-Gillespie: *Land-Surveying*. Required of all C.E. freshmen, first term, 1 hour a week; second term, 3 hours a week. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

THE SOPHOMORE YEAR

- Physics 205, 206. Heat, and Electricity and Magnetism. Lectures based on experimental demonstrations. Frequent written recitations. Edser: *Heat*; Hadley: *Magnetism and Electricity*. Sophomore course, required for C.E., both terms, 3 hours a week. Professor Loomis.
- Mathematics 203, 204. Calculus. Required of all C.E. sophomores, both terms, 3 hours a week. Professors Hun and Swift.
- Mathematics 205. Geometry. A course supplementary to Mathematics 108. Required of all C.E. sophomores, first term, 2 hours a week. Professor Thompson.
- Mathematics 206. Analytical Mechanics. Introductory course. Required of all C.E. sophomores, second term, 2 hours a week. Professor Hun.
- Mineralogy 201. Determinative mineralogy (blow-pipe analysis), preceded by a short course of lectures, including elements of crystallography. Cornwall: *Manual of Blowpipe Analysis and Determinative Mineralogy*. Required of all C.E. sophomores, first term, 3 hours a week. Professor Phillips.
- Geology 202. Elementary course. General outline of the subject, including dynamical, structural, and historical geology. Scott: *Introduction to Geology*. Reference book: Chamberlin and Salisbury: *Geology*. Required of all C.E. sophomores, second term, 3 hours a week. Professor Farr.
- Graphics 201. Elementary descriptive geometry, intersections, development, and model making. Required of all C.E. sophomores, first term, 3 hours a week. Professor Willson, Mr. McWilliams, and Mr. Aymar.
- Graphics 202. (a) Structure drawing. Detail and assembly drawings of bridges, etc., from blue prints or actual measurement. Required of all C.E. sophomores,

second term, 2 hours a week. (b) Graphic solution of kinematic and projective problems, higher plane curves, cams, crystal projection, and mechanisms. Required of all C.E. sophomores, second term, 1 hour a week. Professor Willson, Mr. McWilliams, and Mr. Aymar.

Geodesy 201. Line and angle measurements, farm surveying, field and office work, plotting of field notes. Topographical drawing in pen work and colors, lettering, map of farm survey. McMillan-Smith: *Topographical Drawing*. Required of all C.E. sophomores, first term, 3 hours a week. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

Geodesy 202. Structure and adjustment of engineer's field instruments, leveling, contouring, triangulation, and transit work. Lectures, recitations, field and office work. Staley-Gillespie: *Land Surveying*; Tracy: *Plane Surveying*. Required of all C.E. sophomores, second term, 3 hours a week. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

THE JUNIOR YEAR

Mathematics 305, 306. Analytical Mechanics. The general principles of mechanics; the statics and dynamics of particles, rigid bodies, and fluids. Lectures. Required of all C.E. juniors, first term, 3 hours a week. Professors Gillespie and MacInnes.

Astronomy 303. General Astronomy. Elementary astronomy for engineers. Lectures and recitations from textbook, with special reference to preparation for Geodesy 302. Young: *Manual of Astronomy*. Required of all C.E. juniors, first term, 3 hours a week. Professor Dugan.

Astronomy 304. Practical Astronomy. Determination of time, latitude, and azimuth. Practice with the tran-

sit instrument, sextant, and theodolite. Determination of latitude with the zenith telescope. Required of all C.E. juniors, second term, 2 hours a week. Professor Dugan.

Civil Engineering 301. Materials of Construction. Descriptive course. Required of all C.E. juniors, first term, 2 hours a week. Professor Smith.

Civil Engineering 302. Mechanics of Materials. Strength and elasticity of materials and applications to beams, columns, and shafts. Required of all C.E. juniors, second term, 4 hours a week. Professor Smith and Mr. Condit.

Geodesy 301. Town, mine, and hydrographic surveying. Barometric leveling, surveying with the stadia and gradienter. Solar transit. Lectures, recitations, and field work. Raymond: *Surveying*; Staley-Gillespie: *Land Surveying*. Required of all C.E. juniors, first term, 4 hours a week. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

Geodesy 302. Railroad engineering. Lectures, recitations, and field work. Searles: *Field Engineering*. Required of all C.E. juniors, second term, 5 hours a week. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

Graphics 301. Advanced descriptive geometry, pure, and as applied to developable, double-curved, and warped surfaces, spherical projections, and trihedrals. Lectures, textbook work, and practical drafting. Willson: *Descriptive Geometry*. Required of all C.E. juniors, first term, 2 hours a week. Professor Willson, Mr. McWilliams, and Mr. Aymar.

Graphics 302. Shadows, perspective, and valve-motion. Lectures, illustrated with lantern slides, textbook work, and practical problems on the drawing board. Willson: *Shadows and Perspective*; Halsey: *Slide*

Valve Gears. Required of all C.E. juniors, second term, 3 hours a week. Professor Willson, Mr. McWilliams, and Mr. Aymar.

Civil Engineering 303. Graphical Statics. Review of the general principles of force polygons and of funicular polygons. Applications to the solution of direct, flexural, shearing, and torsional stresses, determination of centers of gravity and moments of inertia. General and special applications to girders and framed structures, non-continuous and continuous. Merriman and Jacoby: *Part II*. Reference book: Eddy: *New Constructions in Graphical Statics*. Required of all C.E. juniors, first term, 3 hours a week. Mr. de Forest, under the direction of Professor McMillan.

Geodesy. Summer field practice. Extended field operations and office work, occupying the two weeks following the close of the second term of junior year. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

THE SENIOR YEAR

Civil Engineering 401. Framed Structures. Analytical and graphical determinations of stresses in girders and simple trusses, including the design of details. Johnson: *Modern Framed Structures, Part I*. References: Blue Prints of Shop Drawings. Required of all C.E. seniors, first term, 5 hours a week. Professor McMillan and Mr. de Forest.

Civil Engineering 402. Framed Structures. The theory of cantilever bridges, of arched bridges, of suspension bridges, of swing bridges, and of steel-frame buildings. Merriman and Jacoby: *Roofs and Bridges, Part IV*. Required of all C.E. seniors, second term, 3 hours a week. Professor McMillan and Mr. de Forest.

Civil Engineering 403. Theory of Prime Motors. General relations of the factors of energy and power con-

sidered analytically and graphically: reduction of inertia and all resistances to driving point; efficiency; general theory of water motors (rotative); thermal motors:—combustion, calorific powers of fuels, theory of chimney-draft, efficiency of generator. Rankine: *Steam Engine and Other Motors*. Reference books: Ewing: *The Steam Engine and Other Engines*; Ripper: *Steam Engine*; Ennis: *Applied Thermodynamics for Engineers*; Weisbach: *Hydraulic Motors*. Required of all C.E. seniors, first term, 3 hours a week, with laboratory work. Prerequisite courses: Physics, Applied Mechanics (analytical and graphical), Chemistry. Prerequisite to Civil Engineering 404. Professor McMillan and Mr. de Forest.

Civil Engineering 404. Theory of Prime Motors. Recitations and lectures. General equations of thermodynamics; expansion and compression curves of gases and vapors, diagrams of energy [p. v. and t. e.]; modifying causes of diagrams; compound engines; explosive or combustion engines:—Otto cycle; compression and expansion curves; combustion engines with carburetting; oil-engines. Rankine: *Steam Engine and Other Motors*. Reference books: Ewing; Ripper; Ennis; Clerk: *Gas Engine*. Required of all C.E. seniors, second term, 3 hours a week. Prerequisite courses: Physics, Applied Mechanics (analytical and graphical), Chemistry. Professor McMillan and Mr. de Forest.

Civil Engineering 405. Hydraulics. Theory. Required of all C.E. seniors, first term, 2 hours a week. Professor Smith or Mr. Condit.

Civil Engineering 406. Water Works. Outlining of the planning and construction of systems of water supply. Lectures. Reference book: Turneure and Russell:

Public Water Supplies. Required of all C.E. seniors, second term, 2 hours a week. Professor Smith.

Graphics 401. Stereotomy. Descriptive geometry applied to the solution of such problems in stone cutting as are likely to arise in railroad or architectural construction. A lecture and drafting-room course. Required of all C.E. seniors, first term, 2 hours a week. Professor Willson and Mr. Aymar.

Civil Engineering 408. Sewerage and Drainage. The sewerage and drainage of buildings and towns; including sewage purification and disposal. Folwell: *Sewerage*. Required of all C.E. seniors, second term, 2 hours a week. Professor McMillan and Mr. de Forest.

Civil Engineering 409. Railroad Engineering. Preliminary and location surveys of routes, staking out for construction, and estimating cost. Field and office work. Searles: *Field Engineering*. Reference book: Wellington: *Railway Location*. Required of all C.E. seniors, first term, 3 hours a week. Professor Harris, Mr. Place, Mr. Bolmer, and Mr. Brewster.

Civil Engineering 410. Roads. Traction on different surfaces. Considerations affecting the value of a road improvement; the location of country roads; road construction and maintenance. Pavements, materials and qualities, tests of materials. Morrison: *Highway Engineering*. Required of all C.E. seniors, second term, 2 hours a week. Professor Harris.

Civil Engineering 412. Masonry Structures. The theory of the stability of masonry structures. Required of all C.E. seniors, second term, 2 hours a week. Professor Smith and Mr. Condit.

Civil Engineering 414. Methods of Construction. Study of the methods employed in the building of engineering structures. Foundations. Baker: *Masonry Construction*. Required of all C.E. seniors, second

term, 2 hours a week. Professor Smith and Mr. Condit.

Civil Engineering 415. Laboratory Work. The erection of structures, the gauging of water, the testing of motors and of materials of construction. Required of all C.E. seniors, first term, 2 hours a week. Professor Smith, Mr. Condit, and Mr. de Forest.

Civil Engineering 416. Laboratory Work. The erection of structures, and the testing of motors. Required of all C.E. seniors, second term, 1 hour a week. Professor McMillan, Mr. Condit, and Mr. de Forest.

EXAMINATIONS, STANDING, AND GRADUATION

MODE OF CONDUCTING EXAMINATIONS

All written examinations and written recitations are conducted under the honor system. A student is not watched during an examination by any officer of the University, but he is required to write on his paper a pledge that he has not been guilty of any dishonesty or irregularity in connection with the examination.

The administration of the honor system is in the hands of a student committee by whose rules it is the recognized duty of every student to report to the committee any evidence of dishonesty in examination that may come under his observation. If after investigation of such evidence the committee finds a student guilty of dishonesty, it reports his case to the Faculty with a recommendation that he be finally dismissed from the University.

REGULATIONS RESPECTING CONDITIONS AND ABSENCE FROM EXAMINATION

I

Conditions are incurred:

(1) By failure to satisfy the requirements of any course. The requirements of a course include both the term work and the examination.

(2) By exclusion from an examination on the recommendation of a preceptor. On the recommendation of a preceptor a department may exclude a student from the examination in any course in which his work with the preceptor has been unsatisfactory.

(3) By exclusion from an examination on the recom-

mendation of a laboratory instructor. On the recommendation of a laboratory instructor a department may exclude a student from the examination in any course in which his work with the laboratory instructor has been unsatisfactory.

(4) By absence from an examination. Absence from an examination, due to whatever cause, is counted as a condition if the term grade in the subject is below the passing mark. When a student's term grade in a subject is above the passing mark, the examination may be postponed on account of illness (*a*) at the time of the examination, (*b*) immediately preceding it, (*c*) during a considerable portion of the term; such a postponement must be authorized by the Committee on Examinations and Standing before the time of the examination, unless the student is ill at the time of the examination. In all cases of absence from an examination, the deficiency must be made up as if it were a condition.

II

(1) A student who, at the end of a term, has conditions amounting to half a term's work, or more, is dropped from his class. In applying this rule, (1) not only conditions of that term are counted, but also conditions of a year's standing or more, and all entrance conditions, provided the student has been in Princeton more than a year; (2) unavoidable absence from an examination shall be counted as a condition one year after the date of the omitted examination, unless meanwhile the deficiency has been made good.

(2) A student of the Department of Civil Engineering thus deficient, or a freshman who at the end of his first term fails in half of his work, or more, may after the lapse of a whole term during which he must be absent from Princeton, and with the permission of the Faculty, enter the next lower class; but a student dropped from his class at the end of an academic year may, with the permission of

the Faculty, be allowed to enter the next lower class at the beginning of the next academic year. (See Sec. II, 7.)

(3) Any other student, except a senior, thus deficient may, after the lapse of a whole term during which he must be absent from Princeton, and with the permission of the Faculty, either enter the next lower class, or re-enter college with an arrangement of studies which will make it possible for him to meet the requirements for his degree by the February following the graduation of his class; or, if the quality of his work warrants it, he may be permitted to take extra courses and graduate with his former class; but a student dropped from his class at the end of an academic year may, with the permission of the Faculty, be allowed to enter the next lower class at the beginning of the next academic year. (See Sec. II, 7.)

(4) A student thus deficient at the end of the first term of senior year may, with the permission of the Faculty, continue with his class during the second term, but an opportunity is not given him until the next academic year to remove his conditions in first term courses, and thus to qualify for his degree.

(5) A student of the Department of Civil Engineering who, after the condition examinations in September, has standing against him a condition in any mathematical or technical course shall be dropped from his class. (In cases where this rule applies, it will replace rules 8 and 9 of Section III.)

(6) A senior who receives conditions during his final examinations has an opportunity to remove these conditions before Commencement unless his total deficiency amounts to half of a term's work or more. (But see Sec. III, 1, 8 and 9.) In applying this rule all conditions, of whatever term, and also all entrance conditions, are counted. If he then removes all his conditions, he may be recom-

mended to receive a degree with his class. No further opportunity is given him until the next academic year to remove his conditions and thus to qualify for a degree.

(7) A student who has been dropped from his class for failure in his studies and who wishes to re-enter the University must make application for permission to do so through the Registrar. If re-admitted, he will be on trial for one term, this trial to be terminable at any time by the Faculty if his work is unsatisfactory.

III

Examinations for the removal of conditions occur as follows:

(1) For the removal of entrance conditions by examination opportunities are given in December during the last week before Christmas vacation, and also at the regular entrance examinations in June and September. No examination for the removal of an entrance condition is given to a senior after the regular examination period in December.

(2) If a freshman having an entrance condition in a subject maintains a standing of third group, or better, for the year, in all the courses which he takes in the department concerned, the condition will be cancelled, provided that he have a certificate from his school stating that he has met the requirements of the subject in his school.

(3) A student having an entrance condition still standing at the beginning of sophomore year, or later, will be required to take, for the purpose of cancelling the condition, an additional course or courses in the department concerned, under the direction of the Committee on Examinations and Standing. A course so taken becomes part of the student's schedule and a condition in it will be treated the same as a condition in any other course.

(4) Examinations for the removal of conditions incurred by seniors at the end of the first term of senior

year are given during the days immediately preceding the Easter recess. These examinations may be taken only by seniors. (But see Sec. II, 4.)

(5) For the removal of all conditions examinations are held during the two weeks beginning on the second Monday preceding the opening of the University in September.

(6) There are no other opportunities for the removal of a condition by examination, except at the examination period corresponding to the one when the condition was originally incurred, and then only by an arrangement made with the examiner previous to the examination period.

(7) Upon application to the Faculty a student may be allowed to remove a condition in an elective course by taking and satisfying the requirements of an extra elective course of at least as many hours. But only one such extra course may be taken in any term, and this course must be applied for before the opening of the term in which it will be taken.

(8) A student who is excluded from an examination by a department on the recommendation of a preceptor or of a laboratory instructor (see Sec. I, 2 and 3), is not allowed an examination for the removal of the condition incurred, but must either repeat the course or substitute an extra course for it, as the Committee on Examinations and Standing shall direct. A senior who, in the second term, falls under this rule may remove the condition by examination, but not until the next academic year.

(9) Whenever the Committee on Examinations and Standing, acting on its own motion or on the recommendation of any department of the University, finds that a student has neglected the work of a course in which he has incurred a condition, such condition cannot be removed by examination, but only by repeating the course or by substituting an extra course for it, as the Committee on Examina-

tions and Standing shall direct. A senior who, in the second term, falls under this rule may remove the condition by examination, but not until the next academic year.

IV

A fee of \$3 shall be charged for each examination taken for the removal of a condition; also for the examination in a course which has been repeated (see Sec. III, 8, 9), or which has been taken for the removal of a condition (see Sec. III, 7).

STANDING

The results of the term examinations are combined with those of the work done during the term to decide the relative standing or rank of the student.

The rank in each course is determined by the instructor, who computes from the term work and examinations the marks of the class; those who have satisfied the requirements of the course are classified in five groups in the order of merit.

The first group indicates very high standing and contains not more than ten per cent of the entire class.

The second group indicates high standing and contains not more than twenty per cent of the entire class.

The third group indicates medium standing and contains not more than thirty-five per cent of the entire class.

The fourth group indicates low standing and contains not more than twenty-five per cent of the entire class.

The fifth group contains the remainder; it indicates very low standing.

The general rank of a student is determined by combining his group numbers in the several courses in proportion to the allotted schedule time of each. The students whose averages are highest, and above an established limit, are assigned to the first general group; those next highest

to the second general group, and so on through the general groups.

A report of the standing of each student is made to his parent or guardian by the Registrar at the close of the first term and at the close of the year. The latter report gives also the standing for the whole year.

DEGREES

A student who passes his final examinations is ordinarily recommended by the Faculty for the degree appropriate to his course, and if the recommendation is approved by the Trustees, the degree is conferred at Commencement and the diploma of the University is given.

FINAL RANK

The final rank of members of the graduating class is computed by combining the averages for the several years of the course, except that the average for the freshman year is omitted in those cases in which it would lower the standing of the student. The names of the members of the first and second general groups thus determined are published in alphabetical order in each group. Special Honors in particular departments are awarded.

COMMENCEMENT SPEAKERS

The student whose individual rank is highest is ordinarily awarded the Latin Salutatory by vote of the Faculty. The Valedictory is awarded with special regard to the qualifications of the student as a valedictorian as well as on the ground of scholarship.

In the award of all degrees and honors, regard is had to the conduct of the student during his course, and any student who has incurred serious discipline may be debarred from the rank to which otherwise his scholarship would have entitled him.

GENERAL ORDERS

TERMS AND VACATIONS

The year is divided into two terms of eighteen weeks each.

The first term of the next academic year (1914-1915) will begin on Wednesday, the 23rd of September, 1914, and end on Wednesday, the 10th of February, 1915. The second term will begin on Thursday, the 11th of February, 1915, and end on Tuesday, the 15th of June, 1915, the day of the annual Commencement.

The Thanksgiving Recess in 1914-1915 will extend from November 25th, 1.30 p. m., to November 30th, 10.30 a. m.; the Christmas vacation from December 23rd, 1.30 p. m., to January 7th, 10.30 a. m.; and the Easter Recess from March 31st, 1.30 p. m., to April 6th, 10.30 a. m. Also, there are no class exercises on Washington's Birthday. There is no summer session.

REGULATIONS CONCERNING REGISTRATION AND THE CHOICE OF ELECTIVES

RULES FOR REGISTRATION

At the beginning of the academic year each undergraduate student shall report in person at the Registrar's Office before 3 p. m. on the Thursday on which the University opens, and register his full name, home address, and Princeton address.

In every case of neglect or delay in registration three absences will be recorded against the student for each day that the registration is delayed. Serious cases will be punished by putting the student on probation, by suspension, or otherwise, as the Faculty may determine.

Any absence from a class exercise incurred in the three

days before or after a vacation or recess shall count as equivalent to two absences incurred at any other time.

CHOICE OF ELECTIVES

It is very desirable to obtain from each student his choice of electives as early as possible, so that the rolls of the elective classes may be made out before the opening of the term. The students are therefore requested to report to the Registrar their choice of electives for the first term of the next academic year on or before the 19th of May. Changes which the student desires to make in his choice may be made by letter to the Registrar in the summer vacation. No changes will be allowed after the 19th of September.

The choice of electives for the second term of the current academic year must be reported to the Registrar on or before the 19th of January. No changes will be allowed after the 2nd of February.

The penalty for delay in reporting the full list of electives for the term shall be the record of one absence each day for each elective not reported until the list is complete; this delay to be reckoned from the registration at the beginning of the academic year or from the 19th of January. Serious cases shall be punished more severely as the Faculty may determine. If the student enter any elective class after exercises with that class have been held, he shall be reported by the instructor as absent from those exercises.

REGULATION OF ATTENDANCE.

1. The Dean of the College has charge of all matters pertaining to attendance on chapel and class exercises. Office hours from 2 to 3 p. m. daily except Saturday, in Nassau Hall.

ATTENDANCE ON CLASS EXERCISES

2. Each undergraduate student is required to attend the scheduled exercises of his class. A student who, for any cause, incurs fifty absences in any term, or any two successive terms, must take an extra course of three hours a week in the next term. All absences above fifty will be counted toward an additional extra course. In case of unavoidable absence for a prolonged period, the application of this rule may be modified by the Faculty upon recommendation of the Dean of the College.

3. If any senior becomes liable for an extra course through absences incurred during the second term, the awarding of his degree shall be deferred until after Commencement. Exemption from the application of this rule may be granted by the Faculty upon recommendation of the Dean of the College.

4. Flagrant cases of absence will necessitate immediate withdrawal from the University.

ATTENDANCE ON CHAPEL EXERCISES

5. Every undergraduate student is required to be present twice each week at morning prayers in the chapel unless excused by the President. If a student at any time falls short of this requirement by four absences, he must during the next two weeks attend four times in addition to the four times above provided for. Failure to comply with this rule will render him liable to suspension.

6. Every undergraduate in residence at the University is required to attend at least one half of the Sunday morning chapel services each quarter. Failure to comply with this rule will render him liable to suspension.

INFIRMARY REGULATIONS

1. The Sanitary Committee shall have general control of the medical administration of the Infirmary, the care of

patients and the relations of physicians or nurses to the Infirmary, or to each other, subject to the approval of the Board of Trustees.

2. The University Physician will be in attendance at the Infirmary every day from 8.45 to 10.00 a. m., and from 5.00 to 6.00 p. m. There will be no charge to students for consulting him at the Infirmary.

3. Any physician legally registered or licensed to practise medicine in the State of New Jersey will be privileged to attend patients in the Infirmary upon the approval of the Sanitary Committee. Physicians who desire to attend patients at the Infirmary will make application to the Secretary of the Sanitary Committee. This rule does not apply to physicians or surgeons called in consultation by an attending physician.

4. Assignments of patients to individual rooms at the Infirmary will be made at the discretion of the University Physician.

5. Should the number of patients at the Infirmary at any time become so large as to require the removal elsewhere of convalescents to make room for cases of serious illness, it shall be the duty of the University Physician to determine which patients may, with safety, be removed in the emergency.

6. Only emergency cases will be operated on at the Infirmary.

7. Every patient will be required to leave the Infirmary promptly after being dismissed by his physician.

8. Patients who have been dismissed from the Infirmary and who desire to return there for dressings, will be attended by the University Physician during the regular dispensary hours, from 8.45 to 10.00 a. m., and from 5.00 to 6.00 p. m.

9. If special nurses are required, they will be procured at the direction of the University Physician and controlled by the Infirmary and the expenses charged to the patient.

10. Visitors to patients will be admitted between the hours of 1.30 and 5.30 p. m. Visitors are not admitted to the contagious ward.

PUBLIC WORSHIP

Prayers are offered in Marquand Chapel every week-day morning.

Divine service, under the superintendence of the President, is held in Marquand Chapel on Sunday at 11 o'clock a. m.; and a brief vesper service, attendance upon which is optional, is held in Marquand Chapel every Sunday afternoon at 5.30 o'clock.

COMMENCEMENT EXERCISES

The Annual Commencement takes place on the Tuesday preceding the last Tuesday but one in June.

The Baccalaureate address to the graduating class is delivered on Sunday of Commencement week.

The Class Day exercises of the graduating class and the annual meetings of the Literary Societies are held on Monday of Commencement week. The alumni trustee election and the annual alumni luncheon are held on Commencement Day.

PUBLIC LECTURES

TRASK LECTURES

The income from \$10,000, presented by the late Spencer Trask of the Class of 1866, is available to secure the services of eminent men to deliver public lectures before the University on subjects of special interest.

STAFFORD LITTLE LECTURESHIP ON PUBLIC AFFAIRS

Founded in 1899 with a gift of \$10,000 by the late Henry Stafford Little of the Class of 1844. At the suggestion of the donor, the Hon. Grover Cleveland, ex-President of the United States, was invited to deliver before the students of the University "such lectures as he might be disposed to give from year to year," and until his death in 1908 Mr. Cleveland was the Stafford Little Lecturer. Since 1908 this lectureship has been held in turn by the Hon. George Brinton McClellan, LL.D., of the Class of 1886; the Hon. Joseph H. Choate, LL.D., D.C.L., and the Hon. Elihu Root, LL.D. The Stafford Little Lecturer for 1913-1914 is President Jacob Gould Schurman, D.Sc., LL.D., of Cornell University.

THE LOUIS CLARK VANUXEM FOUNDATION OF
PRINCETON UNIVERSITY

A bequest of \$25,000 under the will of Louis Clark Vanuxem of the Class of 1879, \$10,000 of which has been paid in. By direction of the executors, the income of this foundation is to be used for a series of from four to six public lectures before the University annually, at least one half of which shall be on subjects of current scientific interest. The lectures are to be printed and distributed among schools and libraries generally.

THE ALBERT PLAUT CHEMICAL CLUB FUND

Established in 1912 with a gift of \$5,000 by Mr. Albert Plaut, of New York. The income is to be used for the benefit of the Chemical Club, and primarily for providing lectures before the club by men of distinction in the field of industrial chemistry or a related science.

LECTURES ON MENTAL HYGIENE

Dr. Stewart Paton, of the Class of 1886, Lecturer on Biology, will deliver occasional public lectures before the University during the present winter, on the Individual in Relation to Educational and Social Problems.

EXPENSES

*Board, 36 weeks.....	\$3.00 to \$8.00 per week
Washing, 36 weeks.....	75 cents per week
Tuition and Public Room fee.....	\$160.00 per annum
Laboratory fee, extra for each chemical course involving laboratory work.....	\$5.00 per term
Laboratory fee, extra for the courses	
Physics 101, 102; Physics 201, 202.....	\$5.00 per annum
Apparatus deposits (see below)	
Room rent in dormitories (according to location of room).....	\$18.00 to \$175.00 per annum
Heat, fixed charge (according to location of room)	\$10.00 to \$28.00 per annum
Light, fixed charge (according to location of room)	\$12.00 to \$28.00 per annum
Infirmary fee	\$7.00 per annum
Department of Physical Education fee.....	\$10.00 per annum
Examination fee, payable at time of taking entrance examinations.....	\$5.00
Graduation fee, payable second term, senior year	\$12.00

Apparatus Deposits.—Students pursuing laboratory courses are required to make deposits to pay for apparatus injured or destroyed. At the end of the term any excess in favor of the student is placed to his credit on the bill for the next term. The deposits in the courses are: General Physics—\$5; Chemistry—\$10 for each course (two terms). In Geodesy—freshmen, second term, \$10; sophomores, sec-

* Freshmen and sophomores are required to board at the University Dining Halls. The rate of board for the present year is \$6.00 per week, but students who are unable to pay the full price are given an opportunity to secure employment either at the Dining Halls or in other departments of the University, and thereby to earn a part of the price of board. The amount earned varies, but is frequently as much as \$3.00 per week, making the minimum charge for board \$3.00.

ond term, \$15; juniors, both terms, \$10; seniors, first term, \$5.

Students taking any of the courses in graphics will require a drafting outfit costing from \$18 to \$25.

ESTIMATE OF ANNUAL EXPENSES

UNDERGRADUATE DEPARTMENT

Average minimum, medium, and maximum estimates of the necessary expenses for one year of a student occupying an unfurnished room in a dormitory have been prepared as follows:

	<i>Min.</i>	<i>Med.</i>	<i>Max.</i>
* Board, 36 weeks, at \$3.00 to \$8.00.....	\$108.00	\$180.00	\$288.00
Washing, 36 weeks, at 75 cents per week	27.00	27.00	27.00
Tuition and Public Room fees.....	160.00	160.00	160.00
Infirmary fee.....	7.00	7.00	7.00
Department of Physical Education fee..	10.00	10.00	10.00
Room rent.....	30.00	90.00	200.00
Heat (per room).....	10.00	19.00	28.00
Light (per room).....	12.00	20.00	28.00

Laboratory fees for courses in chemistry and physics, apparatus deposits, books, Hall dues, clothes, furnishings for rooms, incidentals, and traveling and vacation expenses have not been included in these estimates.

* Freshmen and sophomores are required to board at the University Dining Halls. The rate of board for the present year is \$6.00 per week, but students who are unable to pay the full price are given an opportunity to secure employment either at the Dining Halls or in other departments of the University, and thereby to earn a part of the price of board. The amount earned varies, but is frequently as much as \$3.00 per week, making the minimum charge for board \$3.00.

RULES GOVERNING THE ALLOTMENT AND RENTAL OF ROOMS

I. Rooms will be assigned members of the University for occupation during the following academic year between the 15th of May and the 1st of June of each year.

II. This assignment will embrace:

(a) All rooms occupied by students whose connection with the University will terminate at the end of the academic year.

(b) The rooms of all seniors, whether with room-mate or not (unless the room may be retained by a graduate or for a brother, as elsewhere provided in the rules).

(c) All rooms for which the lease has not been properly renewed.

III. An allotment may also take place at the close of the first term of each academic year for the purpose of assigning such rooms as may then fall vacant.

IV. (a) The assignment of rooms will in all cases not herein specially excepted take place in such a manner that specific rooms shall be assigned by lot.

(b) The rooms to be assigned are classified according to the amount of their rental, without heat and light, in eight groups as follows:

(1) The first group embraces rooms whose rental is from \$18 to \$36, inclusive. There are 78 single rooms in this group.

(2) The second group embraces rooms whose rental is from \$40 to \$66, inclusive. There are 85 single rooms in this group.

(3) The third group embraces rooms whose rental is from \$70 to \$100, inclusive. There are 129 single rooms and 18 double rooms in this group.

(4) The fourth group embraces rooms whose rental is from \$105 to \$140, inclusive. There are 58 single rooms and 12 double rooms in this group.

(5) The fifth group embraces rooms whose rental is from \$150 to \$180, inclusive. There are 57 single rooms and 34 double rooms in this group.

(6) The sixth group embraces rooms whose rental is from \$200 to \$240, inclusive. There are 19 single rooms and 103 double rooms in this group.

(7) The seventh group embraces rooms whose rental is from \$250 to \$300, inclusive. There are 220 double rooms and one single room in this group.

(8) The eighth group embraces rooms whose rental is over \$300. There are 25 double rooms in this group.

(c) The applicants for rooms will be divided into corresponding groups, each applicant being required to inform the Treasurer in writing before the 10th of May, or the 20th of January, as the case may be, both of his intention to enter the drawing and of the group in which he wishes to be placed.

Every applicant for a room shall agree beforehand, and shall be required, to take the room which may be assigned to him by lot in the group in which he has made application.

(d) Each drawing will begin with the first group and proceed from that group through the other groups successively in the order given above. Any applicant who does not obtain a room in the group to which he first asked to be assigned may be allowed to draw in the next higher group.

(e) If there be any rooms remaining unassigned after a drawing, such rooms may be assigned by subsequent allotment, at such time before the end of the year or of the term as the Treasurer may appoint; such supplementary allotment to be made under the same rules as the principal allotment, with this exception, that the rooms disposed of

by means of it may be classified as above or not, at the discretion of the Treasurer.

(f) a. Priority in the drawing will be determined by the length of time the applicants have been members of the University. The first drawing will include the names of all applicants who have been members of the University for more than one year. A second drawing will include the names of all applicants who have been members of the University one year or less.

b. If the application for a double room is signed by students who have been members of the University different lengths of time, it will be classified and placed in the drawing in which the student who has been a member of the University the shortest length of time would be placed.

(g) a. On or before the 5th day of May there will be drawn by lot from all single and double rooms available for occupancy in the fall, accommodations for 150 entering freshmen, equitably distributed among the several groups according to rental.

b. The Registrar of the University will send to all candidates for admission to the freshman class, who have been admitted at the June examinations, a statement of the location and number of rooms reserved throughout the dormitories for the use of freshmen, together with the rental to be charged in each case, and a statement of the owner's valuation of the furniture, which may have been left in any of the rooms. The student to whom a room may be allotted is under no obligation to purchase furniture which may have been allowed to remain in the rooms as the property of the former occupant. Accompanying this statement will be a form of application blank which may be filed with the Treasurer at any time prior to July 15th, upon which the entering student may indicate in what group he desires to draw for a room and whether, in the event of his failure to draw a

room in the group first chosen, he is willing to enter his application in the next higher group.

(h) Double rooms are separately classified and allotted in accordance with the above regulations. Only such suites as consist of a study and two bedrooms are considered double rooms within the meaning of this clause. No double room can be assigned to a single individual, nor is it within the privilege of any single individual to draw for a double room. Every application for a double room must contain the names of two persons who intend to occupy the room together and who undertake to be jointly responsible for the rent of the same.

(i) Whenever for any reason one of the occupants of a double room is permitted or obliged to cancel his room lease, the remaining occupant must vacate the room at the end of the current academic term, unless he agrees to pay the whole rent, or provide a room-mate who shall join him in signing a new lease for the remainder of the academic year.

V. (a) The tenure and liabilities of those to whom rooms are assigned under these rules shall be the tenure and liabilities expressed in the following lease, which must be signed in the case of each room allotted by the student who is to occupy it, and by his parent or guardian. This lease must be signed and delivered to the Treasurer in each case within ten days of the allotment, except in the case of new students, provided for under Rule 4g.

"This agreement, made the day of , 191 , between the Trustees of Princeton University and of witnesseth, that the said Trustees of Princeton University do hereby lease unto the said Room No. in the Entry of , to hold for the academic year of , paying therefor during the said term unto the said Trustees of Princeton University the yearly rent of \$ in two equal payments, to be made the one within the first four weeks of the first term of the

academic year, the other within the first four weeks of the second term of the academic year.

"And the said covenants to pay the said rent in the manner and at the times aforesaid, and to deliver up the said premises to the said Trustees of Princeton University or its legal representative at the end of said term in as good condition as the same are or may be put into by the said Trustees of Princeton University, reasonable use and wear and tear thereof, and fire and other casualty excepted. The said lessee also covenants that he will not do or suffer to be done any damage in the leased premises, and that, if any damage beyond reasonable wear and tear be done, he will cause the same to be made good as soon as possible at his own expense, employing for that purpose the proper University workmen, and paying the costs thereof at once to the University Treasurer, it being understood that the damage here meant includes the breakage of glass and locks, whether by accident or design. The said lessee further covenants that he will not sublet the same or any part thereof, nor permit any other person or persons to occupy the same or any part thereof, nor make nor suffer to be made any alteration therein without the consent of the said Trustees of Princeton University for that purpose in writing first had and obtained. And the said lessee further covenants that the said Trustees of Princeton University through their authorized representative may enter the said premises for the purpose of viewing or making improvements therein at any reasonable times in the daytime, or at any other time for the legitimate purposes of University discipline. This lease is made on the express condition that it may be terminated by said Trustees through their representative."

. (b) Any occupant of a college room may retain his room until the end of his undergraduate or graduate course, provided he annually notify the Treasurer of his intention of retaining it and sign a new lease before the 1st of May; otherwise his room will be considered vacant and will be included in the next allotment. In case an occupant of a double room be left without a room-mate at the end of the academic year, he may renew his lease upon condition of naming another student of the University who will become joint lessee with him for the following year, unless the room-mate who leaves is a senior or a fourth-year special. It

will also be the privilege of any occupant of a college room to renew his lease at the end of his own tenure in the name of his brother, when that brother is to enter the University immediately.

(c) The right to occupy a room is not transferable and terminates with the expiration of the lease. Any attempt on the part of the occupant of a college room to sell or transfer, directly or indirectly, his right of occupancy will be deemed a fraudulent transaction. The penalty for violating this rule will be forfeiture of the rooms by the new lessee.

(d) The occupant of a college room shall deposit with the Secretary of Business Administration the sum of 25 cents for each key to his room that may be furnished him by the University; and all amounts paid under this clause will be refunded upon return of the key or keys furnished.

VI. (a) The seller and buyer of furniture in rooms allotted to students now in college will be required to file in the office of the Secretary of Business Administration, on or before June 15th, a statement signed by each of the students concerned and by their parents or guardians, to the effect that they have agreed upon a mutually satisfactory price for such of the furniture as the buyer is willing to purchase. In the absence of such an agreement being filed on or before June 15th, the owner of the furniture will be notified to remove it immediately. If this notice is not complied with, the furniture will be sold by the University authorities.

(b) If any of the rooms drawn and held in reserve for the next incoming freshman class contain furniture, the owner of the furniture will be informed that it must be removed not later than the day in September when the dormitories are opened for occupancy; unless the freshman to whom it is allotted shall elect to purchase it at the price fixed by the owner.

VII. No exchange of rooms will be allowed unless formally sanctioned in writing by the Treasurer; and then only upon terms explicitly stated in a written application signed by both parties to the proposed exchange, and not in contravention of the spirit of these rules. Such applications will be kept on file in the Treasurer's office.

VIII. When rooms are vacated during a term, the rent must be paid until the end of the term. An occupant of a college room who expects to be absent on leave for a term may be released from the obligations of his lease, provided he notify the Treasurer before the beginning of the term during which he expects to be absent, and give up the room; but no abatement or drawback of room rent will be allowed for any period less than a term, except in special cases to be stated in writing, and by permission of the Treasurer.

The Faculty of the University is directed to suspend or expel every student that may be found guilty of breaking or evading these rules or of injuring or interfering with the person or property of his successor in a room; or of aiding or abetting another in such transgression, evasion, injury, or interference. The Faculty and all its officers are instructed to take the utmost pains, by ordinary or extraordinary means, to discover such offenders and prevent such offences.

The Faculty is further instructed to report, with the evidence discovered, the name of any graduate or outsider that may be guilty of such offences to the Committee on Grounds and Buildings; and said committee is authorized and directed to procure legal counsel and when the evidence seems to justify it to take appropriate legal proceedings against any and every offender before a court of law.

THE UNIVERSITY DINING HALLS

Freshmen and sophomores are required to take their meals at the University Dining Halls. Juniors and seniors who belong to upperclass clubs eat at those clubs, while non-club men either eat at the Dining Halls or make private arrangements. About ten dining rooms are assigned to freshmen, and a sufficient number to sophomores. Three are assigned to upperclassmen. Students are encouraged to eat in any dining room assigned to their class in which they happen at any particular meal to find congenial friends. In addition to dining rooms there are commons rooms or lounging rooms.

The Dining Halls are subject to constant sanitary inspection. The kitchen is fitted with all the best appliances for cooking and serving on a large scale, and adjoining are a bakery, an ice cream plant, and a milk sterilizing plant. The Halls are in charge of a salaried manager who reports directly to the Secretary of Business Administration. The Manager is assisted by a Dining Halls Committee of fourteen undergraduates, who are consulted on all matters concerning membership, reductions in board, etc. The object of the Dining Halls is to provide wholesome and abundant food at the cheapest rate compatible with proper service, and amid hygienic and attractive surroundings. The fact that non-club upperclassmen are preferring to eat at the Halls rather than make their own arrangements is believed to indicate that the board provided is better than can be obtained elsewhere. The price per week is \$6.00. Students who are unable to pay the full price are given an opportunity to secure employment either at the Dining Halls or in other departments of the University, and thereby to earn a part of the price of board. The amount earned varies, but is in

some cases as much as \$3.00 per week. Students who need to take advantage of this means of reducing their board bills should communicate with the Secretary of the University.

UNIVERSITY BILLS

All university expenses, including board, must be paid in advance to the Treasurer of the University.

Juniors and seniors may take their meals at any house approved by the Secretary of Business Administration. Freshmen and sophomores are required to board at the University Dining Halls.

Students are required to call at the Treasurer's office in the course of the first ten days of each term, and to give information as to their place of boarding, etc., so that their bills can be made out. All bills must be paid within the first four weeks of the term. Failure to comply with this rule will deprive the student of the privileges of the University until payment is made, unless excused by special vote of the Faculty.

When a student enters the University before the middle of the term, he shall pay in full the usual charges for that term, with the exception of the charges for board; if he enter after the middle of the term, he shall pay one-half. For board he shall pay in proportion to the time.

When a student leaves the University, whether voluntarily or by dismissal, before the middle of any term, one-half of the charges for tuition and public rooms for that term will be refunded. But in the case of temporary absence and subsequent return, although the absence be for more than half a term, no such rebate will be granted.

When a student is dismissed from the University for any cause, the advance deposit for board, heat, and light,

beyond the time of dismissal, will be refunded to his parent or guardian.

When at the end of the first term the amount of the advance deposit proves to be in excess of the sum required to defray the board or room bills of any student, the excess will be credited on his bill for the next term. At the end of the academic year the amounts overpaid by the members of the *graduating class* for board, room rent, heat, and light will be refunded by the Treasurer to the student's parent or guardian. The parent or guardian of *every undergraduate* will be advised of the amount of excess to the credit of his son or ward, and such amount will be *carried over to his credit on the bill of the first term of the following year*. In case of the withdrawal or dismissal from the University of any undergraduate at the end of the college year, such excess will be refunded by the Treasurer to the parent or guardian, when informed by the Clerk of the Faculty that such undergraduate has been withdrawn or dismissed from the University.

PRIZES

ALEXANDER GUTHRIE MC COSH PRIZE

The interest of \$1,500 will be given annually to that member of the senior class who shall write the best essay in philosophy, including psychology, logic, metaphysics, and the history of philosophy. Any one of the following subjects may be chosen: James's Theory of the Emotions; The Relation of Reason to Imagination; The Free-will Controversy; The Relation of Philosophy to Religion. The essay must be presented on or before March 14.

LYNDE DEBATE PRIZES

Three prizes—the income of \$5,000, contributed by Charles R. Lynde, Esq.,—will be awarded by a committee, appointed by the Faculty, to the three successful competitors in a debate held immediately prior to the trials for the appointment of intercollegiate debaters. The debaters are six in number, three from each of the Literary Societies, and are selected by committees appointed by the Societies respectively from their own members in the Faculty.

BAIRD PRIZES

Through the liberality of Charles O. Baird, Esq., the following prizes, representing the income of \$6,000, will be given to those who excel in the oratorical exercises of the senior class, viz.: The Baird Prize of \$100 to the best speaker of those who have ranked among the first six writers in any two of the three subjects of English literature, rhetoric, and oratory; a prize for oratory of \$50 to the best speaker, exclusive of the Baird Prizeman, of those who, in the same departments, have ranked among the first twelve writers; a prize for delivery of \$30 to the best speaker exclusive of the two just mentioned; also, a prize for poetry of

\$50; and two prizes of \$40 and \$30, respectively, for the best and second best written disputations.

CLASS OF 1859 PRIZE

The interest of \$2,000, given by the Class of 1859, will be awarded to that member of the senior class who shall write the best essay on William Hazlett, Essayist, and pass the best examination on The Brook-Farm Movement. The essay must be handed in on or before May 31, and the examination will be held in June. The subject of the essay for the Class of 1915 will be Ruskin and Pre-Raphaelitism.

GEORGE POTTS BIBLE PRIZES

The yearly interest of \$1,000, given in 1867 by Mrs. Sarah A. Brown, expended in the purchase of two copies of Matthew Henry's Commentary on the Bible, will be presented to the best two Biblical scholars of the senior class at the end of their course.

LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE

This prize, being the annual interest on the sum of \$1,000, contributed by the Class of 1883, was instituted as a memorial of the Rev. Lyman H. Atwater, D.D., LL.D., Professor of Political Science. It will be given to that member of the senior class who shall have passed the best examination and written the best thesis on some subject in political science, to be assigned by the professors in charge of Jurisprudence and Politics.

The thesis must be in the hands of the Chairman of the Department of History and Politics by June 1; the examination will be held on that day. The subject for the thesis in 1914 and the basis on which the examination is to be set will be: The Place and Powers of the President in our Constitutional System.

FREDERICK BARNARD WHITE PRIZE IN ARCHITECTURE

The late Mrs. Norman White established in memory of

her son, Frederick Barnard White, of the Class of 1883, a prize in architecture, yielding \$40. The prize is open to the entire junior and senior classes and to special students who take a full schedule of studies. The subject of the essay for this year is: Church Façades of the Renaissance Period. The subject of the examination is Renaissance Architecture. The essay should be presented on or before May 15.

CLASS OF 1869 PRIZE IN ETHICS

The annual interest of \$3,000, given by the Class of 1869, will be awarded to that member of the senior class who shall pass the best examination in ethics and write the best essay. The essay to be presented on or before June 1. The subject of the essay for the Class of 1914 will be: The Practical Value of Ethical Theory.

C. O. JOLINE PRIZE IN AMERICAN POLITICAL HISTORY

The sum of \$50 will be awarded annually at Commencement to that member of the graduating class who shall have maintained a creditable standing in the subject of American history, and who shall have submitted the best written dissertation upon Leisler's Rebellion.

The dissertation must be at least 5,000 words in length and must be accompanied by a bibliography of the subject. Specific references to the sources used must be given throughout.

The prize shall be awarded by the professor or professors in charge of the Department of American History.

NEW YORK HERALD PRIZE

The yearly interest of \$1,000, presented by James Gordon Bennett, Esq., will be given to that member of the senior class, or to the special student of satisfactory standing, who shall have taken for both terms of senior year at least two of the courses given by the Departments of

History and Politics, and of Economics, and at least one course in English literature for both terms, and who shall have presented the best thesis in English prose upon some subject of contemporaneous interest in the domestic or foreign policy of the United States Government. The thesis must be in the hands of the Chairman of the Department of History and Politics by June 1. The subject for the thesis in 1914 will be: Is it or is it not desirable to have a redistribution of powers between the federal and State governments of the United States?

CLASS OF 1876 MEMORIAL PRIZE FOR DEBATE IN
POLITICAL SCIENCE

This prize is to be given annually by the Class of 1876 to the successful contestant in a debate on a subject of current interest in American politics, to be held on Washington's Birthday, said prize to be the interest of \$2,000. The competitors, four in number, one from each class, are to be chosen by a vote of their respective classes.

PHILO SHERMAN BENNETT PRIZE IN POLITICAL SCIENCE

The interest on the sum of four hundred dollars, the gift of the late Philo Sherman Bennett, of New Haven, Connecticut, to be bestowed on that member of the senior or junior class of the University who shall write the best essay discussing the principles of free government. The essay must be in the hands of the Chairman of the Department of History and Politics by the first of June.

SPENCER TRASK DEBATING FUND

The interest of \$3,000, given by the late Spencer Trask, of the Class of 1866, is used to promote debating. At present one-third of the interest is awarded to the best debater in the trials for the intercollegiate debates with Yale and Harvard; one-third for library books used in connection with debating; and one-third for general debating expenses.

PRIZE IN AMERICAN HISTORY, ESTABLISHED BY THE SOCIETY
OF COLONIAL WARS IN THE STATE OF NEW JERSEY.

The sum of \$50 will be awarded every alternate year, beginning with the year 1912-13, to that undergraduate of Princeton University who shall have submitted the best written dissertation upon some subject of American Colonial History assigned by the Department of American History.

The dissertation must be at least 5,000 words in length and must be accompanied by a bibliography of the sources used. Specific reference to the sources must be given throughout.

Dissertations in competition must be in the hands of the Registrar before May 1, and must be submitted anonymously. The names of the authors should be inclosed in sealed envelopes and attached to the dissertations.

The prize shall be awarded by the Professor or Professors in charge of the Department of American History, and the decision shall be announced at Commencement.

The subject for the year 1914-1915 is: William Franklin, Last Royal Governor of New Jersey.

GARRETT PRIZE IN SOUTH AMERICAN HISTORY

The sum of \$100, the gift of John W. Garrett, Esq., Minister to the Argentine Republic, will be awarded annually to that member of the Princeton undergraduate body who shall have submitted the best essay upon some subject of early Argentine history.

The essay must be at least five thousand words in length and must include a bibliography of the sources used. Specific references to the sources must also be given throughout.

The subject for the essays of the year 1913-1914 will be: The Establishment of the Argentine Confederation of 1825. The essays must be in the hands of the Chairman of the Department of History and Politics before June 1.

WOOD LEGACY

The sum of \$150, the income of a legacy of Dr. George

B. Wood, will be awarded to that member of the junior class who shall stand highest for the junior year.

JUNIOR ORATOR MEDALS AND MACLEAN PRIZE

Four gold medals, or books of equal value, will be awarded by a committee, appointed by the Board of Trustees, to the four successful competitors in an oratorical contest during Commencement week. The competitors are eight members of the junior class—four from the Clio-sophic and four from the American Whig Societies—selected by committees appointed by the Societies respectively from their own members in the Faculty.

The Maclean Prize, founded by the will of the late Henry A. Stinnecke, consisting of the sum of \$100, will be given to that one of the orators chosen by the Literary Societies from the junior class who shall during Commencement week pronounce the best English oration.

The committee of judges will be composed of a professor of English and two graduates of the University not members of the Faculty.

DICKINSON PRIZE

The Dickinson Prize, founded in 1782 by the Hon. John Dickinson, of New Jersey, Governor of Pennsylvania and Delaware, consisting of a medal of the value of \$60 (or its equivalent in money), will be awarded to that member of the junior class who shall write the best dissertation upon a theme in logic. Either of the two following subjects may be chosen: The Nature and Validity of Inductive Reasoning; The Criterion of Truth. The dissertation must be presented on or before May 21.

CLASS OF 1870 JUNIOR ENGLISH PRIZES

Of the yearly interest of \$1,500, one-half will be given to the best Old English scholar, and one-half to the best English literature scholar of the junior academic class.

THOMAS B. WANAMAKER ENGLISH LANGUAGE PRIZE

This prize, the yearly interest of \$1,000, will be given to that member of the junior academic class who shall pass the best examination in English philology (Course 303), and write the best thesis on some assigned topic therein.

MARY CUNNINGHAM HUMPHREYS JUNIOR GERMAN PRIZES

Two prizes, of \$25 and \$15 respectively, established by the late Professor Willard Humphreys, in memory of his mother, Mary Cunningham Humphreys, will be awarded to those members of the junior class who, having taken the regular German course for at least two years (all the courses in the Germanic Section of the Modern Language Department in junior year and either Courses 105, 106 or 203, 204) shall, at the close of the second term, pass the best examinations on the work of the term.

THE R. PERCY ALDEN MEMORIAL PRIZE

The income of \$1,000, given by Mr. John P. C. Alden of the Class of 1907, and divided into a first and second prize, will be awarded annually to the two members of the Junior French course who shall submit the best essays on a subject relating to French memoirs. The essays must be presented on or before May 15.

CLASS OF 1883 PRIZES FOR ENGLISH IN THE SCHOOL
OF SCIENCE

Class of 1883 English Prize for Juniors in B.S. and Litt.B. Courses:—This prize, the annual interest of \$1,000, will be given to that member of the junior class, a candidate for the degree of B.S. or Litt.B., who shall have done the best work in the English studies of the year (Old English excepted) and submitted the best essay on a subject in English literature assigned by the English Department.

Class of 1883 English Prize for Freshmen in Civil Engi-

neering Course:—This prize, the annual interest of \$1,000, will be given to that member of the freshman class, in the civil engineering course, who shall have done the best work in the English studies of the year, and shall have submitted the best essay on a subject assigned by the English Department.

STINNECKE PRIZE

The Stinnecke Foundation was established in 1870 by the will of the late Henry A. Stinnecke, of the class of 1861, and was supplemented by a bequest received in 1876 from his aunt, Miss Maria Stinnecke. The income is divided between the Stinnecke Scholarship of \$500 and the Maclean Prize of \$100.

The Stinnecke Scholarship, of the annual value of \$500, tenable during the undergraduate course unless forfeited by neglect of study, is given every third year "to that person who, having entered the sophomore class, passes the best examination at the opening of the session in September, in the Odes of Horace, the Eclogues of Virgil, and the Latin Grammar and Prosody, as well as the Anabasis or Cyropædia of Xenophon and the Greek Grammar." Students of the University who have been members of the freshman class, as well as new students entering the sophomore class, will be admitted to such examination. The committee of examiners is appointed by the Board of Trustees. The next competition for this scholarship will be held in the autumn of 1914.

CLASS OF 1861 PRIZE

The interest of \$1,200 given by the Class of 1861, will be awarded to the member of the sophomore class who shall pass the best examination at the end of the year on the honors mathematics of the sophomore year.

FRANCIS BIDDLE SOPHOMORE ESSAY PRIZE

This prize, the yearly interest of \$500, will be given to

that member of the sophomore class who shall write the best English essay of the year.

CLASS OF 1870 SOPHOMORE ENGLISH PRIZE

This prize, the yearly interest of \$1,000, will be given to that member of the sophomore academic class who shall pass the best examination on the English studies of the year.

ORANGE ALUMNI ASSOCIATION PRIZE SCHOLARSHIP

This scholarship, which pays the holder \$200 per annum, the income from \$4,000 given by the Princeton Alumni Association of the Oranges, will be awarded in accordance with the following conditions:

I. Only those are eligible to compete for this scholarship whose parents or family shall at the time of the competition have been resident for at least one year in the district of the Princeton Alumni Association of the Oranges, and who themselves are in residence at Princeton as regular members of the freshman class in a course leading to a bachelor's degree.

II. For those eligible to compete for this scholarship a special examination shall be arranged as early in the first term as may be convenient, the material of which shall be selected from the subjects required for entrance. The Faculty shall name as winner of the scholarship that student who stands highest in this examination, and as alternate the student who stands next highest. This alternate may become the holder of the scholarship in case of the death or removal of the winner.

III. The scholarship shall be retained by its winner during his freshman and sophomore years, provided that in his studies he maintains a rank not below the second general group and that he does not come under serious discipline for misconduct.

The next competition will be in the autumn of 1915.

REMISSION OF TUITION

Candidates for the degree of Bachelor of Arts, Bachelor of Letters, or Bachelor of Science of insufficient means and of more than ordinary intellectual ability may apply for remission of a part of the charge for tuition. Applicants who present satisfactory testimonials as to scholarship and character and proof that the assistance is absolutely needed will be granted remission of fifty dollars a term from the charge for tuition on admission to the University. This remission is in the form of a loan, and all who receive it are required to sign a non-interest-bearing note, to be held by the University, which the signer holds himself morally bound to pay at the earliest date practicable.

Remission of tuition is granted in all cases for one term and subject to the following conditions:

I. The student must be regular in attendance at his college exercises and free from serious discipline.

II. His college standing, as shown by his latest semi-annual report, must not be below the third general group.

III. His college bill for one term for board, room rent, light, and heat must not exceed \$150.00.

An applicant who has fulfilled these conditions during the first term of a college year will be granted remission of fifty dollars from the charge for tuition for the second term of that year without further action on his part.

In accepting remission of tuition it is understood that a student agrees to devote his time and energies to his studies, and if his work shall appear to suffer by reason of participation in extra-curriculum activities, or if his scale of living shall seem to be out of proportion to his means, he shall forfeit the remission of tuition even though he shall have complied technically with the rules.

For application blanks and further information apply to the Secretary of the University, Princeton, New Jersey.

SCHOLARSHIPS

SCHOLARSHIPS FOUNDED BETWEEN 1853 AND 1902
(Income now used for University Scholarships)

In 1853 the Trustees authorized the Faculty to take such measures as might seem to them necessary towards securing a number of scholarships with a principal of one thousand dollars each. Pursuant to this authorization, between 1853 and 1902 sixty-four scholarships with a principal of one thousand dollars each were endowed by John Aitken, E. F. Backus, A. B. Baylis, Charles S. Baylis, James Blair, Isaac V. Brokaw, Mrs. P. Bullard, Hons. Simon and Donald Cameron (1), Aaron Carter, Jonathan Cogswell, D.D., Roswell Colt (3), Stephen Colwell, A. Creswell, Hon. Amzi Dodd (the Bloomfield Scholarship), Aaron Fenton, A friend, A friend (the Henry M. Alexander Scholarship), A friend of President Maclean (the John Maclean Scholarship), Friends of President McCosh (the James McCosh Scholarship), Hon. Henry W. Green, Dudley S. Gregory, Richard T. Haines, Gen. N. Norris Halsted, Albert O. Headley, Dr. Hugh L. Hodge, Capt. Silas Holmes (5), Hon. John P. Jackson, Peter Jacobus, Jacob J. Janeway, D.D., Ladies of the Presbyterian Church of Huntington, N. Y., James Lenox (5), Drs. John and George M. Maclean (1), J. D. McCord, Frederick Marquand, Members of the Class of 1841, Members of the Class of 1856, Members of the First Presbyterian Church of Bridgeton, N. J., Members of the First Presbyterian Church of Peekskill, N. Y., Members of the First Presbyterian Church of Trenton, N. J., Members of the Second Presbyterian Church of Elizabeth, N. J., George W. Musgrave, D.D., Matthew Newkirk, Dr. Samuel H. Pennington, Hon. Nehemiah Perry, Isaac N. Rankin, Harry E. Richards, M.D., George L. Sampson (the Henry J. van Dyke Scholarship), Joseph R. Skidmore, I. S.

Spencer, Alanson Trask, Joseph N. Tuttle, Hon. John Van Vorst, William White, and Chandler Withington; and one scholarship with a principal of one thousand five hundred dollars was endowed by Henry M. Flagler.

During the same period twenty-one memorial scholarships with a principal of one thousand dollars each were endowed as follows:

The Cyrenius Beers Scholarship by Miss Julia Beers, the J. S. Bonsall Scholarship by a bequest of Mrs. Susan R. Bonsall, the Albert Dod Brown Scholarship by Mrs. Susan D. Brown, the Grace Newcombe Denning Scholarship by Mrs. William Moir (\$1,500), the Finley and Breese Scholarships by a bequest of Samuel F. B. Morse, the Elizabeth Musgrave Giger Scholarship by Prof. George M. Giger, D.D., the Charles Dickinson Hamill Scholarship by Samuel M. Hamill, D.D., the Matthew B. Hope Scholarship by the Trustees of the College of New Jersey as an acknowledgment of the services of Prof. Hope in raising an endowment of over one hundred thousand dollars, the Jeremiah D. Lalor Scholarship by a friend, the Harvey Lindsley Scholarship by Mrs. Emeline Coney Lindsley, the John C. D. Matthews Scholarship by Mrs. Mary R. Matthews, the Newark Scholarship by the will of Henry Rogers, the Ezra Nye Scholarship by F. Wolcott Jackson, the John Joseph Rankin Scholarship by William Rankin, the Laurance Field Stevens Scholarship by Herbert B. Stevens, the Nathaniel W. Townsend Scholarship by Mrs. Daniel Haines, the William Campbell Truesdell Scholarship by Warren N. Truesdell, the Van Sinderen Scholarship by Mrs. and Miss Van Sinderen, the Robert Voorhees Scholarship by Mrs. Susan V. Clark, and the Gertrude N. Woodhull Scholarship by Dr. John N. Woodhull.

In 1913 a bequest of one thousand dollars was received from the Estate of Mrs. Mary Hale Chamberlain to endow the Hale Scholarship in memory of Titus Hale and Mary H. Hale, his wife.

In 1903 the Trustees decided to grant remission of tuition to applicants for scholarships who were candidates for the degree of Bachelor of Arts in accordance with the plan described in the section entitled Remission of Tuition; and to use an amount approximating the income from scholarships founded prior to 1903 for the creation of forty University Scholarships to be awarded in the manner described in the section entitled University Scholarships. In 1909 the privileges of remission of tuition and University Scholarships were extended to candidates for the degrees of Bachelor of Letters and Bachelor of Science.

UNIVERSITY SCHOLARSHIPS

From the income derived from scholarships founded prior to 1903 forty University Scholarships have been established: ten "A" Scholarships of the annual value of one hundred and sixty dollars each, and thirty "B" Scholarships of the annual value of one hundred and thirty dollars each. During the summer these scholarships will be awarded for the first term to members of the senior, junior, and sophomore classes who are candidates for the degree of Bachelor of Arts, Bachelor of Letters, or Bachelor of Science, and who have previously received remission of tuition, in accordance with the following rules:

(a) The ten "A" scholarships will be awarded to those students whose standing during the previous year was in the first general group. If more than ten students are eligible, award will be made according to seniority of class.

(b) The thirty "B" scholarships will be awarded to those students whose standing during the previous year was in the second general group. If more than thirty students are eligible, award will be made according to seniority of class, except that students eligible for "A" scholarships shall take preference over all others.

University Scholarships are awarded in all cases for one term and subject to the following conditions:

I. The holder must be regular in attendance at his college exercises and free from serious discipline.

II. His general group, as shown by his latest semi-annual report, must not be below that in which he stood when the scholarship was awarded to him.

III. His college bill for one term for board, room rent, light, and heat must not exceed one hundred and fifty dollars.

The holder of a University Scholarship who has fulfilled these conditions during the first term of a college year will receive the scholarship for the second term of that year without further action on his part.

ENDOWED SCHOLARSHIPS

The endowed scholarships described in the following list may be assigned to students in any undergraduate department of the University unless restricted by the donor to some particular department or departments. The annual stipend of each scholarship at present is one hundred dollars unless another amount is stated. It is customary to assign these scholarships, when they become vacant, to undergraduates who have been members of the University for at least one year, and who are considered most worthy to receive the benefit.

Application for endowed scholarships should be made to the Secretary of the University, Princeton, New Jersey.

THE ELIZABETH VAN CLEVE SCHOLARSHIP: Founded in 1886, by a gift of two thousand dollars, from Hon. Caleb S. Green, of Trenton, N. J., of the Class of 1837. In 1912 the principal was increased to two thousand five hundred dollars by William E. Green, Esq., of the Class of 1902.

This scholarship is ordinarily assigned to a student in the John C. Green School of Science.

THE WISTAR MORRIS WOOD AND CHARLES MORRIS WOOD SCHOLARSHIP: Founded in 1887, by a gift of two thousand dollars from Rev. Charles Wood, D.D., of Washington, D. C. In 1908 the principal was increased to two thousand five hundred dollars by the donor.

This fund shall ordinarily in the first instance be given to a member of the junior class, or in case no member of the junior class answers the conditions, then to any member of the lower classes answering them. Conditions: I. To any foreign missionary's son intending himself to become a foreign missionary; II. To any student proposing to labor in the foreign field; III. To any minister's son studying for the ministry. It shall be understood that the recipient of the fund must possess and keep up superior scholarship.

THE RACHEL LENOX KENNEDY SCHOLARSHIP FUND; with an income of six hundred dollars: Established in 1888 by Miss Rachel Lenox Kennedy, of New York, with a principal of five thousand dollars and increased by the donor in 1890 by a further gift of ten thousand dollars. The income from this fund is used to aid meritorious undergraduates in any department of the University who have maintained high standing in their classes.

THE BUTLER SCHOLARSHIP; with an income of eighty dollars: Founded in 1892 by William Allen Butler, Jr., of New York, of the Class of 1876. The original gift was one thousand dollars, to which the founder added five hundred dollars in 1905 and five hundred dollars in 1909.

THE McCORMICK SCHOLARSHIP; a gift of two thousand dollars: Founded in 1894 by Mrs. Cyrus Hall McCormick, of Chicago. The annual stipend is eighty dollars.

THE WALLACE SCHOLARSHIPS; (two with an income of one hundred and twenty-five dollars each): In 1898 Mrs.

R. H. Allen and Miss Wallace, of Newark, N. J., gave five thousand dollars to found two scholarships in memory of their father, William C. Wallace, of the Class of 1823, for the benefit of needy students.

THE JOHN LINN PATTON SCHOLARSHIP: Founded in 1903, with a principal of two thousand five hundred dollars, by Mr. and Mrs. William A. Patton, of Philadelphia, in memory of their son, John Linn Patton, of the Class of 1903.

THE MAHLON LONG SCHOLARSHIP: Founded in 1904 by Rev. George Wells Ely, of Columbia, Lancaster County, Pa., by a gift of one thousand two hundred and fifty dollars and real estate in Minneapolis, Minn., and Jersey City, N. J., valued at eight thousand seven hundred and fifty dollars.

This scholarship is open to undergraduates, members of either the Academic or Scientific Department, and is intended to be given during the entire course to the same student, although appointments or reappointments may be changed by the person having the power, in his discretion. The donor may, during his life, designate the beneficiary, but in case he should not do so on or before October first of each year, then the President of the University shall designate the beneficiary, selecting a regularly matriculated candidate for a degree, who, in his judgment, is a young man of limited means, of worthy character and capacity and who gives promise of a useful life. The net income from this scholarship shall be used by the beneficiary for tuition and other necessary expenses, but no more than four hundred dollars shall be paid to any one beneficiary annually; whatever excess income there may be to accrue to the benefit of the fund.

THE JOHN H. CONVERSE AND JOHN W. CONVERSE SCHOLARSHIPS; (two, with an income of one hundred and twenty-five dollars each): Founded in 1904 by the late John H. Converse, with a principal of five thousand dollars.

The privileges of these scholarships are to be extended by the Faculty to students looking forward to a seminary course and the Christian Ministry, the Presbyterian Ministry preferred.

THE ROBERT STOCKTON PYNE SCHOLARSHIP: Founded in 1904, with a principal of two thousand five hundred dollars, by Mrs. Moses Taylor Pyne, of Princeton, in memory of her son, Robert Stockton Pyne.

THE FREDERICK WOLCOTT JACKSON SCHOLARSHIP: Founded in 1905, by a gift of two thousand five hundred dollars, from Philip N. Jackson, of Newark, N. J., of the Class of 1881.

THE ANDREW WHITE GREEN SCHOLARSHIP; with an income of two hundred and fifty dollars: Founded in 1905, with a principal of five thousand dollars, by the late Cornelius C. Cuyler, of the Class of 1879, as executor and sole legatee of Andrew White Green. The income to be used in aiding some needy and deserving student each year through his college course; the student to be designated by the President or Dean.

THE HENRY S. GANSEVOORT SCHOLARSHIP: Founded in 1906, with a principal of two thousand five hundred dollars, by Mrs. Abraham Lansing, of Albany, N. Y., in memory of her brother, Henry S. Gansevoort.

THE CLASS OF 1878 SCHOLARSHIPS: Dr. John S. Sayre, of the Class of 1878, who died in 1899, made Princeton University his residuary legatee. After creating the Fellowship of Applied Chemistry and the Fellowship of Applied Electricity, the will directs "the balance of my estate, if any, to be used for as many as possible endowed scholarships in the Academic (Classical) Department of the University which are to be known as the Class of 1878

Scholarships." At present there are six scholarships available under this endowment.

THE GEORGE BLACK REA SCHOLARSHIP; with a principal of two thousand five hundred dollars: Founded in 1908 by Mr. and Mrs. Samuel Rea, of Bryn Mawr, Pa., in memory of their son, George Black Rea, of the Class of 1904. Preference to be given to a student in the Department of Civil Engineering.

THE ALGERNON BROOKE ROBERTS SCHOLARSHIP, CLASS OF 1896: Founded with the principal of twenty-five hundred dollars in accordance with a bequest to his mother, 1909.

THE DR. ANDREW J. MCCOSH MEMORIAL SCHOLARSHIPS: Founded in 1909 with the principal of ten thousand dollars by the late Mrs. Alexander Maitland in memory of her brother, Andrew J. McCosh, M.D., of the Class of 1877. Preference to be given to students in the senior and junior classes.

THE JOHN WITHERSPOON SCHOLARSHIP; with an income of one hundred and sixty dollars: Founded in 1909 by the Trustees of the Witherspoon Memorial Association with a gift of four thousand dollars, the unexpended balance of a fund contributed by patriotic citizens for the purpose of erecting a statue in Washington, D. C., to John Witherspoon.

THE S. STANHOPE ORRIS FUND: Professor S. Stanhope Orris, who died in 1905, bequeathed to Princeton University "the sum of Twenty-five Thousand Dollars (\$25,000) as a fund, the annual income of which shall be divided equally among ten needy academic students of good character and ability, of diligence in study, and exemplary behavior. No candidate for the ministry, however, though needy, studious and possessing ability, shall receive help from this fund unless he pledges himself to continue and do continue the

study of Greek regularly to the end of the University Course."

THE SUSAN BREESE PACKARD MEMORIAL SCHOLARSHIP AND THE FRANCIS APPLETON PACKARD MEMORIAL SCHOLARSHIP, founded by a bequest of five thousand dollars under the will of Professor William A. Packard, who died in 1909: "The income of these Scholarships to be devoted to paying the tuition fees of students in Princeton University pursuing courses of study of which the Greek and Latin languages and literature shall constitute a substantial part. Students of approved scholarship and character who need this aid, and such only, shall be eligible to receive the same."

THE THOMAS AND LUCY KAYE MEMORIAL SCHOLARSHIPS: Founded in 1911 by a bequest of five thousand dollars under the will of John William Kaye of the Class of 1874.

THE WILLIAM ROME GELSTON SCHOLARSHIP: Founded in 1912 with a gift of \$5,000 in memory of William R. Gelston, deceased, of the Class of 1901, "the net annual income thereof to be given in each year to such student in the Academic Department of Princeton University regularly matriculated for a degree, as the President of the University shall consider to be a person of capacity and worthy character, who gives promise of a useful life and is of limited means, such appointee to be designated by said President, and such income shall be used by such appointee, first in the payment of his tuition fees, and the balance shall be used by him in payment of his board and other necessary university expenses".

THE JOHN REID CHRISTIE, JR., SCHOLARSHIP: Founded in 1913 with the principal of twenty-five hundred dollars, received from the estate of John Reid Christie, Jr., of the class of 1913, who died during the summer of 1913.

ENDOWMENT AND ADMINISTRATION OF
SCHOLARSHIPS

The following rules for the endowment and administration of scholarships have been adopted by the Trustees:

I. A scholarship available in any undergraduate department may be endowed by the payment to the Treasurer of a sum not less than twenty-five hundred dollars. Unless otherwise specified by the donor the endowment of a scholarship will be invested with the general funds of the University and the incumbent will receive as annual stipend the income of the endowment at the prevailing rate of interest.

II. The right to nominate the incumbent of a scholarship may rest with the donor, if an individual, during his or her lifetime, or if an institution or alumni association, for a period of twenty-five years. At the end of this period or at the death of the donor, the right of nomination shall revert to and rest with the Faculty of the University.

III. All scholarships shall be held subject to such rules as may be adopted from time to time by the Faculty of the University.

FUNDS FOR CANDIDATES FOR THE MINISTRY

THE RICHARDS FUND: A bequest of Mrs. Esther Richards, of New York, amounting to \$2,970.32, for the benefit of candidates for the ministry. Received in 1790.

THE LESLIE FUND: A bequest of James Leslie of New York, of the Class of 1759, amounting to \$10,677.49, for "the education of poor and pious youths with a view to the ministry of the Gospel in the Presbyterian Church." Received in 1792.

THE HODGE FUND: A bequest of Hugh Hodge, of Philadelphia, of a house and lot on Market street, above Second (No. 205), "to be held by the Trustees in trust, to lease out from time to time, and the rents to be applied to the support and education of pious youths for the ministry." Received in 1805.

For application blanks for aid from the funds for candidates for the ministry apply to the Secretary of the University, Princeton, New Jersey.

CHARITABLE FUND

THE VAN ARSDALE FUND: A bequest of Robert Van Arsdale, of Newark, N. J., of the Class of 1826, amounting to \$3,000, "in trust for promoting charitable instruction in the College of New Jersey, according to the discretion of the Faculty." Received in 1875.

Applications for aid from the Van Arsdale Fund should be made to Professor Howard McClenahan, Dean of the College.

BUREAU OF STUDENT SELF HELP

The Bureau of Student Self Help has been established under the auspices of the Graduate Council of the University for the purpose of providing opportunities for remunerative employment to students who are obliged to earn part of their college expenses. All students who desire to earn money during their college course are advised to register with this Bureau.

Further information may be obtained from Mr. Henry W. Buxton, Secretary of the Bureau of Student Self Help, Princeton University.



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